TECHNOLOGY DEPT.

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FLEET OWNER

First Copy

VOLUME 19
NUMBER 1 •
JULY, 1937

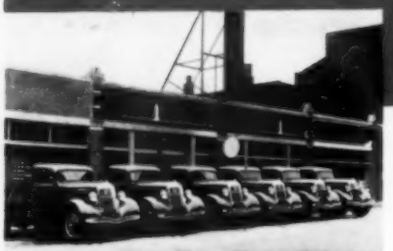
DEVOTED to the BETTER OPERATION and MAINTENANCE of all AUTOMOTIVE FLEETS

REO ALL-TRUCK CONSTRUCTION

MEANS MORE "PROFIT-MILEAGE" PER DAY

Highway Safety Patrols—Charlotte, N. C.

Fleet of Garbage Dumps



Fleet of Dump Trucks—St. Louis, Mo.

7-8 passenger Westchester Suburban Sedans

BECAUSE they are built to sturdy truck standards throughout—strongly constructed to take the brunt of tough hauling jobs—Reo trucks are everywhere demonstrating their ability to pile up more "profit miles" per day.

The brilliant performance of Reo's sturdy Gold and Silver Crown engines under today's speedier operating conditions is proof of Reo's advanced engineering design. Skilled truck specialists have planned each Reo model to meet specific needs with more speed, less cost, and longer life.

Investigate Reo's complete line now. Your dealer will show you a wide choice of models featuring heavier frames, full-floating rear axles, internal expanding hydraulic brakes, and full pressure lubrication. Remember, there's a Reo for every job in every price range—including cab-over-engine metropolitan models. Get maximum hauling profits with dependable Reo Trucks!

REO SPEEDWAGONS AND TRUCKS

Built and sold to Precision Standards. Ask your nearest Reo dealer to show you how the Reo Performance Gauge will insure the selection of exactly the right truck for your needs. Maximum economy is sure to result.

REO MOTOR CAR COMPANY LANSING, MICHIGAN

20,000 Copies of This Issue

Generate *your own Acetylene*

with a Carbic CMP-1

Trade-Mark

delivers 45 cu. ft. of Acetylene an hour . . weighs only 120 lb.

*costs . . . $95.00**

The Carbic CMP-1 Medium-Pressure Portable Acetylene Generator has generating capacity enough for any operation normally requiring one large size acetylene cylinder. It generates acetylene from "Carbic" – high-grade calcium carbide processed and compressed into briquet form. It is economical, efficient, convenient and simple. Ask your Purox or Prest-O-Weld jobber to demonstrate the CMP-1 today.

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
New York and Principal Cities
In Canada: Dominion Oxygen Company, Limited, Toronto

SPECIFICATIONS: Height, overall . . . 52 in.; water shell, diameter . . . 17¼ in.; water capacity . . . 14¾ gal.; weight, empty . . . 120 lb.; weight, fully charged . . . 265 lb.; weight, shipping . . . 170 lb.; charge (No. 20 Carbic Cakes) . . . 1 to 8; acetylene generating capacity, per hr. . . . 45 cu. ft.

* Prices slightly higher west of the Rocky Mountains.

Everything for Oxy-Acetylene Welding and Cutting

LINDE OXYGEN • PREST-O-LITE ACETYLENE • OXWELD APPARATUS AND SUPPLIES FROM UCC LINDE UNION CARBIDE

PRODUCTS OF UNITS OF UCC UNION CARBIDE AND CARBON CORPORATION

20 YEARS AGO THIS MONTH
THE FIRST FORD TRUCK WAS BUILT

TODAY . . . FORD LEADS THE WORLD IN TRUCK-BUILDING EXPERIENCE

The first Ford truck was built July 27, 1917. Because it was built of materials stronger but lighter than those in common use, it combined ruggedness and reliability with low operating cost. Because it was sold in large numbers, its price was low. It was the first low-priced truck of quality, and it met with immediate success. Since 1917, Ford has built more trucks and commercial cars than any other manufacturer . . . more than four million units. Measured in years or in units, Ford leads the world in truck-building experience.

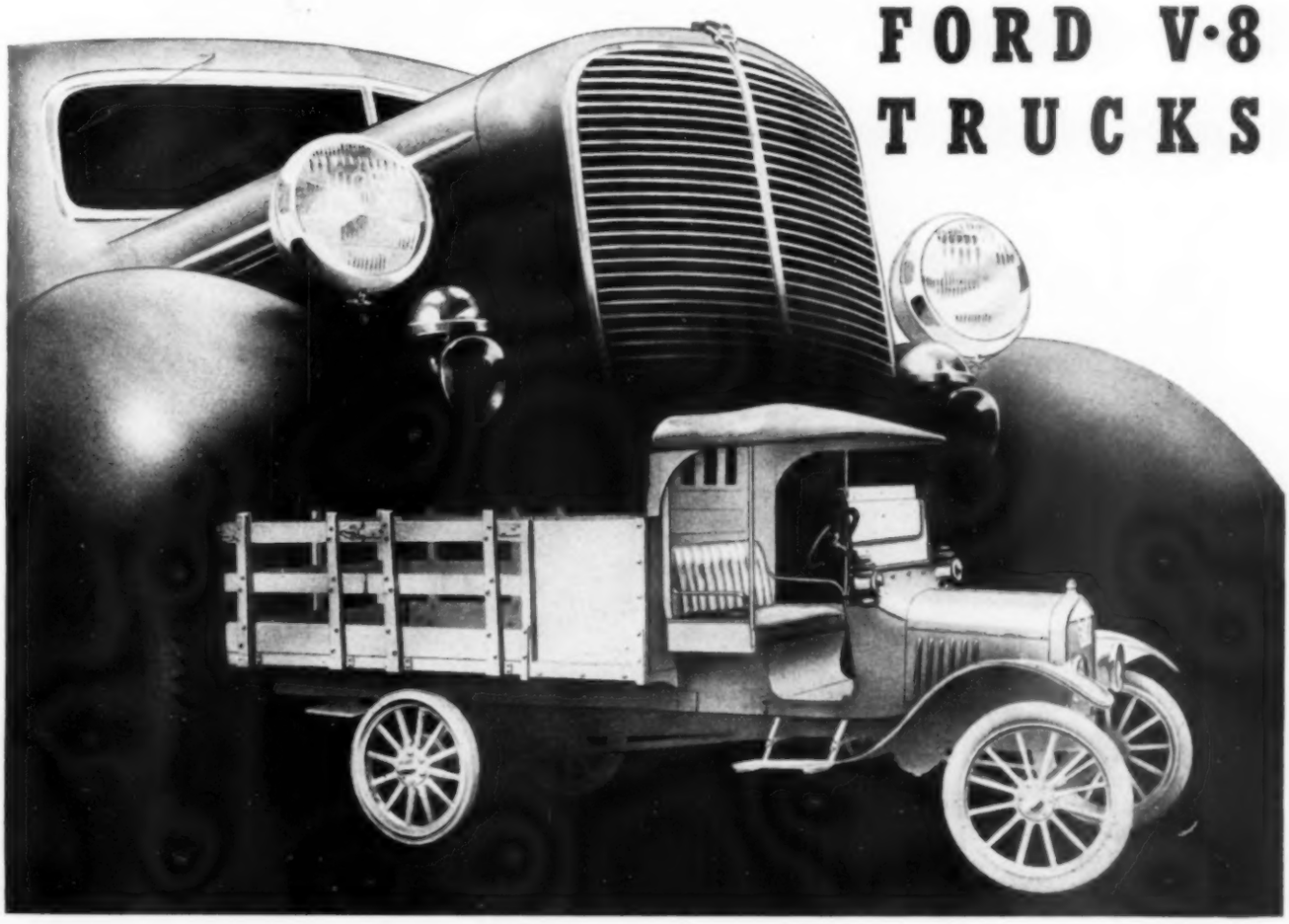
Such experience has enabled Ford engineers to improve the Ford truck year after year. The 1917 model was 40 horsepower and sold for $600. Today's Ford V-8 Truck gives you 85 horsepower and sells for nearly $100 less. Road speeds of 70 miles an hour . . . nearly double the speed of the 1917 model . . . are possible with today's Ford truck. Frames, springs, axles, clutches and wheels have been strengthened for greater load-carrying ability. Safety has been increased by the use of an all-steel cab and Safety Glass.

And as for ECONOMY . . . today's Ford V-8 Trucks show the lowest ton-mile costs of any truck in Ford history.

Try a Ford V-8 Truck under your own operating conditions. Ask your Ford dealer for an "on-the-job" test of an 85-horsepower Ford V-8 Truck if your loads are heavy . . . or for light delivery service with frequent stops, try the thrifty new 60-horsepower Ford V-8.

Convenient, economical terms through Authorized Ford Finance Plans of the Universal Credit Company

FORD V·8 TRUCKS



THEY'RE ALL ALIKE

How long these new designs stay out of the shop depends upon the oil they get. New Texaco can help here, by keeping valves and rings free and active, thus maintaining compression. You'll like New Texaco Motor Oil from the first.

TEXACO

REG. T. M.

TEXACO

IN *This*

No matter how the new vehicles differ in design, they have this in common . . . they are more efficient. You can *keep* them at their peak of performance, indefinitely, by using New Texaco Motor Oil.

At the refinery, this new oil is treated with Furfural, a farm product made from oats, corn, wheat, cotton seed, sugar cane, etc.

The Furfural Process dissolves out impurities that ordinary refinery methods leave in. As a result, New Texaco Motor Oil is *all lubricant* . . . tough, of tremendous film strength, resistant to the heat of hard service, long lasting.

New Texaco Motor Oil will keep your engine clean, active, powerful . . . on the road and out of the shop.

Trained automotive engineers are available for consultation on the selection and application of Texaco Automotive Products. Prompt deliveries assured through 2020 warehouse plants throughout the U. S. The Texas Company, 135 East 42nd St., New York City.

TEXACO MARFAK lasts twice as long in front wheel bearings, steering connections, shackles, universals. Seals bearings against dirt. Clings to metal, resisting washing effect of road water. Some truck operators run front wheel bearings for 50,000 miles on Marfak without removing hub caps.

TRUCK LUBRICANTS

THE NEW AC BLUE TOP

- **LONGER PLUG LIFE**
- **GREATER RELIABILITY**
- **FULL SATISFACTION**

All of the pioneering improvements which earned for AC Regular and Long Life plugs an outstanding reputation for quality and reliability are consolidated in the new AC Blue Top line. *And, in addition, Blue Tops for heavy service incorporate many important new features—expressly developed for bus, truck, and tractor duty.*

Each Blue Top plug is designed to the AC heat range. Each type, furthermore, has a wider heat range itself.

In the new AC Blue Top Spark Plug, consequently, you get longer life, better fuel economy, greater reliability, and full satisfaction.

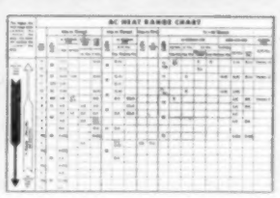
Install the new AC Blue Top yourself. From AC's Conversion Chart, you can quickly select the correct type. Then you will see why Blue Tops are approved for original equipment—and why they are the *better* investment for your special needs.

KEEP PLUGS IN TOP CONDITION
with the
AC SPARK PLUG CLEANER

Designed and built by AC, this machine cleans plugs thoroughly in 5 to 10 seconds. A precision-built shop tool, it pays for itself in a short time.

REFER TO THE AC HEAT RANGE CHART, 1937 Edition, To Remedy Sooting or Pre-Ignition

It quickly shows the hotter plug type which will eliminate chronic fouling; and the cooler type that will correct pre-ignition, blow-by, and rapid electrode wear. This Chart is free.



AC SPARK PLUG DIVISION · *General Motors Corporation* · **FLINT, MICHIGAN**

THESE TRUCKS CLIMB MOUNTAINS, CROSS DESERTS, BUT *ALWAYS* KEEP ON SCHEDULE

Lowell Thomas

KC-LA FLYERS REPORT NO SIDEWALL FAILURES WITH GOODRICH SILVERTOWNS

by Lowell Thomas

Radio News Commentator and World Traveler

A KC-LA Flyer stops at a New Mexico Indian Reservation

"I'd heard a lot about cross-country motor freight but I was amazed when I learned the story of the KC-LA Flyers. They have 40 big trucks pounding the highways night and day. Running daily through service between Los Angeles and Kansas City—a distance of 1883 miles. Near Needles, Calif., trucks climb from 90 feet below sea level to an altitude of 6000 feet in 30 miles. They wind their way up 3000 feet in the last 7 miles—one of the most difficult climbs in the country.

"All in all they travel more than three million tire-killing miles annually.

"Yet these trucks run on train schedules. And schedules are always maintained. They tell me they've never had a premature tire failure with Goodrich Triple Protected Silvertowns."

* * *

And Lowell Thomas can tell you more of the grueling, grinding punishment that Goodrich tires take on the runs of the KC-LA Flyer Transport Company. How they fight snow in the mountains, blistering heat in the desert, how they roll up high mileage that means low tire cost.

You can get the same story from truckers everywhere. On the hardest hauls, on the tire-torture runs, Silvertowns are first choice. They stand up where other tires fail because of Triple Protection. This Goodrich invention actually checks 80% of premature failures! It makes tires run cooler. It adds mileage on any kind of haul.

Only Goodrich gives you this 3-way protection:

1. **PLYFLEX**—distributes stresses throughout the tire—prevents ply separation—checks local weakness.
2. **PLY-LOCK**—protects the tire from breaks caused by short plies tearing loose above the bead.
3. **100% FULL-FLOATING CORD**—eliminates cross cords from *all* plies—reduces heat in the tire 12%.

But Goodrich charges no premium for this tire! You get Triple Protected Silvertowns at regular prices. The extra service is your saving. Why not call a Goodrich dealer right now?

Goodrich *Triple Protected* Silvertowns

SPECIFY THESE NEW SILVERTOWN TIRES FOR TRUCKS AND BUSES

YOU CAN USE A

HOT

OR

COLD

SOLUTION
in cleaning
Motors...Floors...Parts

SOME fleet owners prefer to clean with a HOT solution. With some, cleaning with a COLD solution is more convenient.

Whatever *your* preference may be, Oakite materials are available BOTH for hot and cold cleaning. Both can be relied on for thoroughness in removing every bit of muck and dirt from motors, parts, chassis, floors,

Both Methods Economical

With Oakite materials cleaning is fast . . . low cost. Work is speeded . . . mechanics' time is saved.

It doesn't involve any more than a penny postcard and a few moments of your time to find out how DEPENDABLE Oakite cleaning can help *you*. Write . . . tell us *your* problem. There's no obligation.

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SPECIALIZED INDUSTRIAL CLEANING MATERIALS & METHODS

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FLEET OWNER

Published Monthly in the interests of Automotive Fleet Owners, who Operate or Direct their own Service, and devoted to the Better Operation and Maintenance of Truck, Trailer, Bus, Passenger Car, Taxicab and all Automotive Fleets.

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*MORE in Performance
*MORE in Value
*MORE in Savings

ADD TOGETHER all the claims made for competitive trucks—and you will find GMC equal to the best! Here are not only the most handsome trucks on any road with their entirely original inbuilt "Dual-Tone" design with an option of 12 different color effects, but, we believe, the *thriftiest* trucks as well. Comparative operating costs of 15,000 truck owners (including all makes) prove that *"lowest cost"* is the reasonable expectancy where a GMC is pressed into service. Whatever *your* hauling, see GMC.

QUALITY AT PRICES LOWER THAN AVERAGE

Time payments through our own Y. M. A. C. Plan at lowest available rates

GENERAL MOTORS TRUCKS & TRAILERS

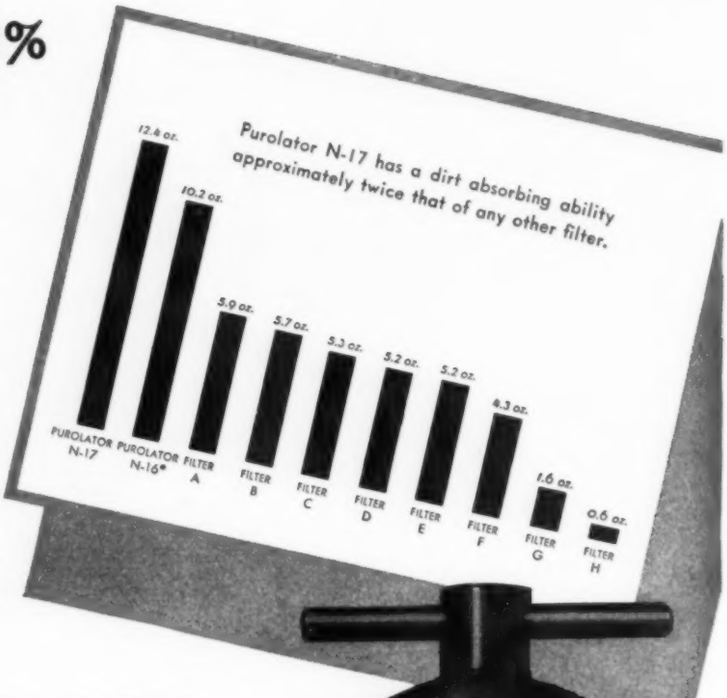
GENERAL MOTORS TRUCK & COACH • DIVISION OF YELLOW TRUCK & COACH MANUFACTURING COMPANY • PONTIAC, MICHIGAN

By actual test—

THE NEW N-17 PUROLATOR

. . . ABSORBS 100% MORE DIRT

. . . KEEPS OIL CLEANER



Graphic results of tests made to determine the actual absorbing capacity, in ounces of crankcase dirt, of the new N-17 Purolator and other depth type filters. All filters were tested under exactly the same conditions: 40 lbs. pressure—160°—SAE 30 oil.

Even distribution of oil and a flow rate determined by exhaustive tests to be most efficient, enable the new N-17 Purolator to *effectively* filter the entire crankcase contents more often than any other filter.

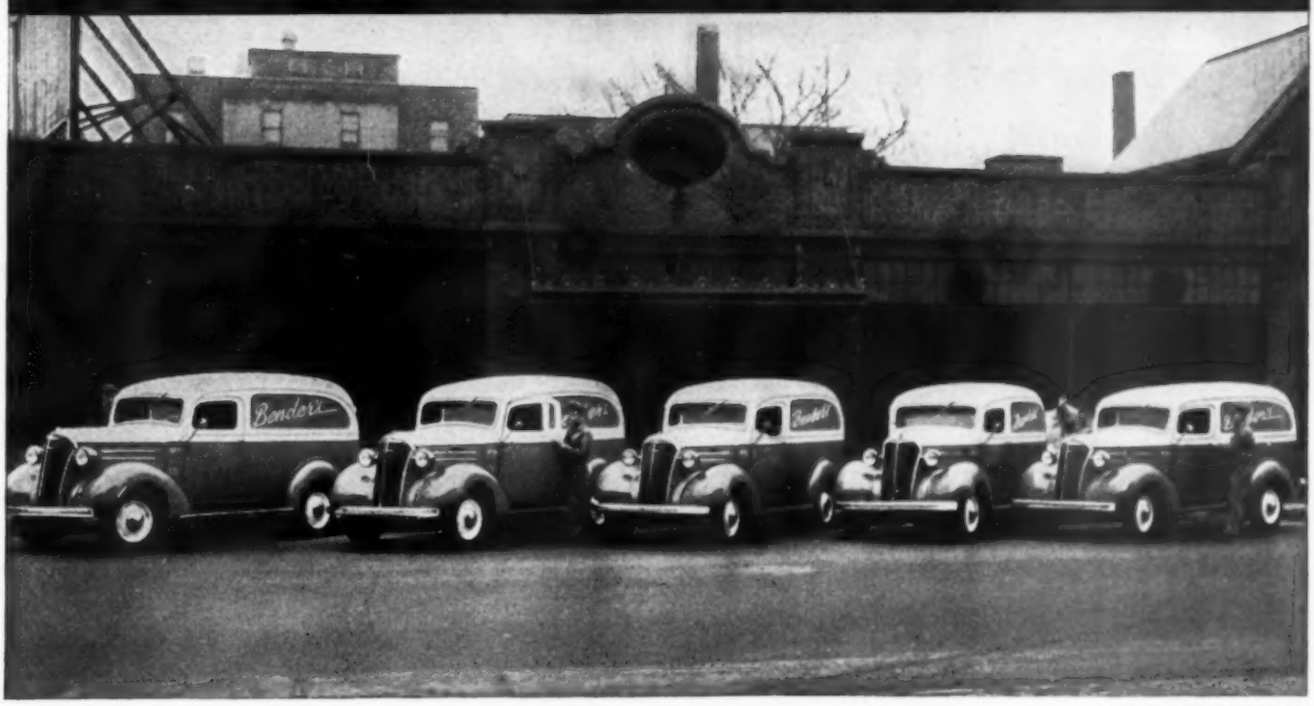
Purolator engineers present . . . a new oil filter—the Purolator N-17—which in exhaustive laboratory and road tests has demonstrated its superiority over any other depth type filter. They urge every fleet maintenance man interested in economy to compare the length of time it keeps oil clear and clean . . . compare the length of its filter element life . . . compare the simplicity of its element replacement.

The greater savings in operating costs, engine wear, and maintenance expense afforded by this filter are just as definite and provable. Your inquiries are solicited. Motor Improvements Inc., 365 Frelinghuysen Avenue, Newark, New Jersey.

N-17 is for engines of 7-10-qt. crankcase capacity.
***N-16,** identical to N-17 except in size, is designed for engines of less than 7-qt. capacity.
The filter element, in its metal container, can be lifted and replaced without use of tools.

PUROLATOR
The Oil Filter

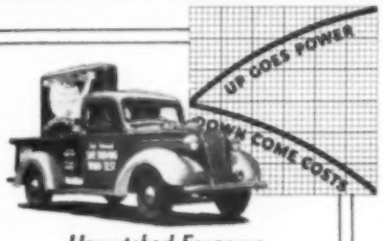
1937 CHEVROLET TRUCKS
and Commercial Cars



Fleet Owners buy Chevrolet Trucks because of bigger loads per trip—higher earnings per unit. They profit from Chevrolet's great pulling power and unmatched operating economy. There's a chassis size and a body style exactly suited to the most practical and economical handling of your haulage and delivery requirements.

General Motors Installment Plan—monthly payments to suit your purse.

CHEVROLET MOTOR DIVISION
General Motors Sales Corporation
DETROIT, MICHIGAN



Unmatched Economy Proved in 10,244-Mile
"RIM OF THE NATION" TEST RUN
With Half-Ton "Economy Model" Pickup—1,000-Pound Load

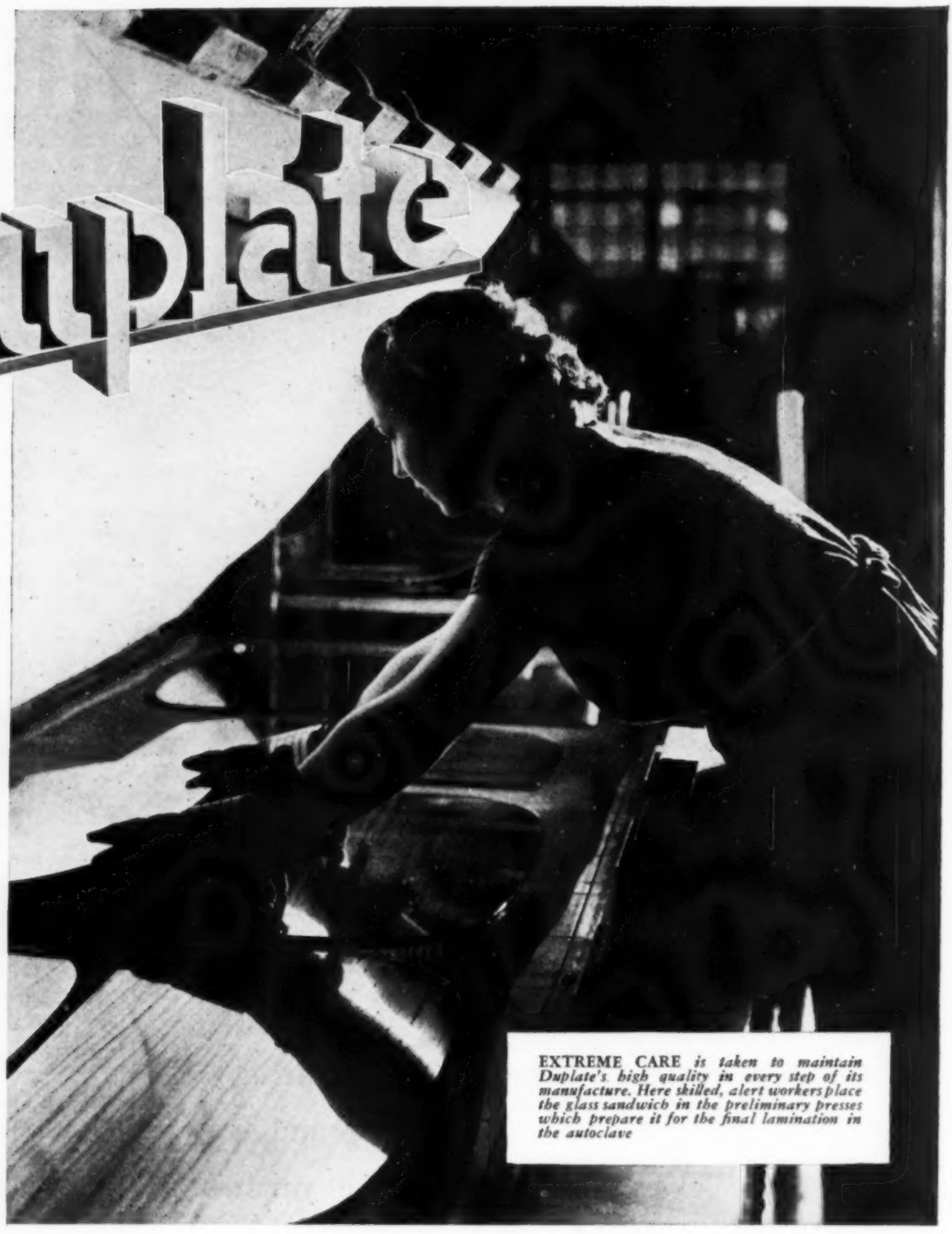
Location of Test	'Round the Nation, Detroit to Detroit
Distance Traveled	10,244.8 Miles
Gasoline Used	493.6 Gallons
Oil Consumed	7.5 Quarts
Water Used	1 Quart
Gasoline Cost	$101.00
Gasoline Mileage	20.74 Miles per Gallon
Average Speed	31.10 Miles per Hour
Running Time	328 Hours, 31 Minutes
Gasoline Cost per Mile	5.0098
Average Oil Mileage	1,365.9 Miles per Qt.
Total Cost of Repair Parts	$0.73

These records have been certified by the A.A.A. Contest Board as being officially correct.

PERFECTED HYDRAULIC BRAKES—NEW HIGH-COMPRESSION VALVE-IN-HEAD ENGINE—MORE LOAD SPACE—IMPROVED LOAD DISTRIBUTION—NEW STEELSTREAM STYLING—IMPROVED FULL-FLOATING REAR AXLE WITH NEW ONE-PIECE HOUSING (on 1½-Ton Models)—NEW ALL-STEEL CAB—PRESSURE STREAM LUBRICATION

"MORE POWER *per gallon* CHEVROLET *per load* **LOWER COST"**

Duplate



EXTREME CARE *is taken to maintain Duplate's high quality in every step of its manufacture. Here skilled, alert workers place the glass sandwich in the preliminary presses which prepare it for the final lamination in the autoclave*

Climaxing **A LONG RECORD OF GLASS ACHIEVEMENT**

THE makers of Duplate Safety Glass have been leaders in glass development and improvement for more than fifty years. Duplate climaxes this long record of quality glass production. It is a safety glass which provides perfect vision from any angle, more dependable and economical service. And it assures greater eye comfort for passengers by cutting down the intensity of dazzling, reflected sunlight seen through it. Make sure you have it all-around in any new equipment. And for glass replacement, call your nearest Duplate dealer.

Paint. PITTSBURGH. Glass
PLATE GLASS COMPANY

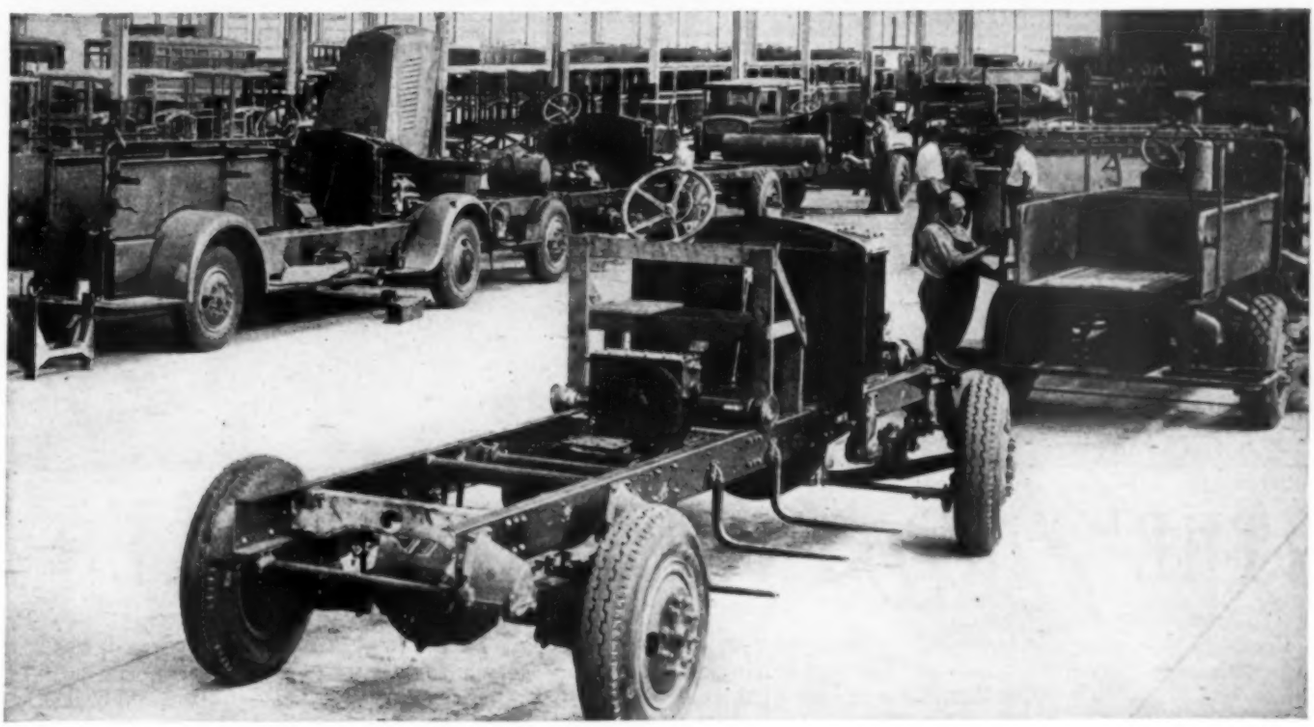
DUPLATE SAFETY GLASS

DUOLITE SAFETY PENNVERNON GLASS

OVER 35 BUILDERS

OF TRUCKS, BUSES AND STOCK ENGINES ACTUALLY USE

SOVAC OILS



WHEN THE MANUFACTURER of your equipment endorses Sovac Oils by using them for test and break-in . . . for drive-away of your vehicle . . . that's proof you can depend upon.

Then consider this important fact: *over 35 leading builders of trucks, buses and stock engines have swung over to Sovac Oils.*

Just two years ago Sovac Oils were introduced. Today, over 1600 individual operators, widely working thousands of trucks and buses, in 35 different fields, coast to coast, have adopted Sovac Oils exclusively!

That's because Sovac Oils, plus the help of Socony-Vacuum's "fleet engineers," enable operators to cut per-mile costs, reduce maintenance expense and slice repairs.

You, too, can cut these profit-eating expenses. A phone call will promptly bring our "fleet engineer" in your territory. Why delay making greater profits? Call now! It will pay you.

SOCONY-VACUUM OIL CO., INC.

STANDARD OIL OF NEW YORK DIVISION · WHITE STAR DIVISION · LUBRITE DIVISION · WHITE EAGLE DIVISION
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SOCONY-VACUUM

THE *New* INTERNATIONALS

International Harvester produces no "yearly model" changes in trucks. A new line is not just a matter of the calendar with this Company. It is interested only in keeping International trucks at top efficiency.

The International "C" models, now on the highways in many tens of thousands, are living evidence that this policy gives the truck user what he needs for hauling satisfaction. There have been no better trucks on the market, but *now* there are better trucks by far—these new Internationals.

The International reputation has advanced steadily on performance and long life, on unequalled nation-wide service, and on the truck user's final objective—ECONOMY.

In the meantime, International has been constantly at work on engine and chassis design, load distribution and braking, increased power, fuel economy, and driver comfort. The resources of its engineering staff, its laboratories, its plants and proving grounds were centered in the development of a fundamentally better product. Today the many improvements are consolidated in this *completely new* line of trucks.

Today International Harvester offers truck users the finest value of the year, a product *engineered* to the moment and *styled* for public acceptance. These new trucks are on display at any International branch or dealer showroom.

● *Illustration shows the new International 3 to 4-ton Model D-50 with semi-trailer body of special design. International sizes range from the Half-Ton unit in the low-price field up to rugged Six-Wheelers.*

INTERNATIONAL HARVESTER COMPANY
606 So. Michigan Ave. (INCORPORATED) Chicago, Illinois

INTERNATIONAL TRUCKS

VOL. 19
NO. 1

FLEET OWNER

JULY
1937

DEVOTED TO THE BETTER OPERATION AND MAINTENANCE OF TRUCK, TRAILER, BUS, TAXICAB, PASSENGER CAR, AND ALL AUTOMOTIVE FLEETS.

Stripping *the* Thread » »

(The Editor's Column)

MAN BITES DOG, ETC.

● It's not "news" any more, when a safety picture is released by a safety council, an insurance company, a state government or similar public-spirited organization. . . . But when a *fleet operator* spends his money on such an undertaking, and then offers to loan the picture to other fleet operators, free, gratis and for nothing, that surely looks like front-page "news" to us. . . . Here's the story: The Coca Cola Company (which is the sponsoring organization for all of the various Coca Cola Bottling Companies throughout the United States) has recently produced a first-class safety picture entitled *"The Wheel of Chance."* . . . The picture (with sound) surely is a honey. Its 26 minutes of film carries a marvelous message of safety and common-sense, especially intended for making good truck drivers safer ones. . . . The original object in bringing out this film, of course, was to bring home the message of safety to all drivers in all Coca Cola organizations. . . . However, after several executives of other fleets had the opportunity of seeing (and hearing) it, the requests for a "loan" of the picture were so numerous that the generous Coca Cola Company had a lot of extra copies made, and decided to lend it to any fleet operator who might request it. . . . There's no need of our describing the picture here. It is sufficient to say that this picture drew three immediate cheers from Yours Truly when he had an opportunity of reviewing it last month. It's the last word in safety pictures and certainly ought to do lots of good in sending down the accident curve of any fleet organization showing it to its drivers. . . . And, strange as it may seem, there's not a bit of advertising in it, in spite of the strong advertising-mindedness of the makers of "The Pause That Refreshes." . . . Our suggestion is that you arrange for a safety meeting of your drivers some warm evening this month or the next. Serve hot-dogs and beer (excuse us, we mean Coca Cola) if you will. But get into touch with Editor Fischer immediately and ask him to *try* to arrange for a loan of the picture, free, telling him the *exact* date that you want it. . . . We are not guaranteeing, absolutely, that you'll get it just when you want it, but we'll try our best. . . . Just another little service that we are glad to perform for our readers, in their interests and the interests of safety. . . . And, our congratulations, Coca Cola. . . . (P.S. You don't need any moving picture machines or special equipment to show this, as everything comes complete. All you *do* need is a dark room and a bed-sheet.)

●

IT FLIES THRU THE AIR—

● Yes, but perhaps not with the greatest of ease. . . . Plunging upward through the air at high speed and landing with terrific impact, this standard 1½-ton Dodge truck, equipped with stake body, was put through such performance seven times in less than 40 minutes, so we are told. . . . The object? So that Dodge engineers could test its safety and control features, as well as to find out something about its ruggedness in construction. . . . This test was recently made at the factory proving grounds and the picture proves it.

●

ADVERTISEMENT

● One of our good fleet-executive friends is making a change, seeking the *toughest* job in fleet operation that is open today. Although we do not as a rule recommend fleet men, this is *one* time that we are pleased to do so because we are familiar with the work he has done. . . . We have never gone out on "parties" with him and our personal acquaintance has been limited to shaking hands with him at an S. A. E. meeting, for instance. . . . Nevertheless, because we know his capabilities, we are glad to render this little service in calling his availability to the attention of fleet owners everywhere. . . . This man's *first* choice is an "unorganized" fleet which needs standardization, and the establishment of economic methods of operation and maintenance. . . . His background includes more than 20 years' experience, both on the West Coast and in the East, with fleets of

(Please turn over)

●

H. Clay Fischer
Editor

●

The Editor's Column » »

(Continued from Page 15)

MEMBERS of the Automotive Transportation Supervisors Association enjoying their South Bend visit recently as guests of the Chicago branch of Bendix Products. . . . They made the round trip in a Greyhound bus, had lunch at the Bendix plant, and afterwards inspected the plant itself and the Bendix Brake school. The trip was arranged by Frank C. Olson, Chicago branch manager, and these are the men who went—Front Row (left to right): Boston Store's Lewis; B. A. Railton's Strunz; Standard Oil's McCreadie; Pennoyer's Rosenberger; Ry. Express' Dour; Decatur Cartage's O'Brien; American Can's Bertsch. . . . Second Row: Weil-McLain's Koeppe; Union Dairy's Bauer; Illinois Bell's Haase; Insurance Patrol's Jansen; Pennoyer's Smith; Atlas Brewery's Skala. . . . Third Row: Ohio Brass' Becker; Bendix's Wilson; Lake City Laundry's Schwartz; Public Service's Albright; Illinois Bell's Donham; Public Service's Johnson; Peoples Gas' Hinckley; Liquid Carbonic's Petersen; Liquid Carbonic's Petrac; Fred Olson & Son Madison. . . . Rear: Bendixers, Rothkopf, Olson, Feragen, Golden, Cunningham. . . . Missing during photographing: Chicago Park's Clabaugh and McElroy.

national proportions and scope. . . . If we were to mention this man's name you would immediately recognize it because of the fine work he has done. . . . If you think there is a place for him in your organization, please address him directly, at Box 834, Old Greenwich, Conn. . . . We think he is the type of man who will locate anywhere.

•

BOWS TO FLEET MEN

• F. C. Hubley, general service manager of Autocar, paid a tribute to fleet men recently, at a three-day meeting of national Autocar men in Ardmore, Pa., when he said: *"The real expert in the automotive field today is the motor truck buyer, who is as a general rule very intensely informed on the engineering features of his vehicles."* . . . He further pointed out the fact that these gentlemen are now making it their business to thoroughly acquaint themselves with the engineering specifications of the jobs they buy; that many of them are practical metallurgists and ask technical questions as to metals and treatment. . . . The reason, Mr. Hubley believes, lies in the fact that the truck is often the sole means of income of its owner and his business compels him to understand its specifications. . . . Any automotive vehicle, he pointed out, represents by far the most expensive piece of machinery which is entrusted to the hands of non-technical men (drivers) for operation; but in the case of trucks, even drivers have become virtually technical experts. . . . All of which is very interesting and something to which we heartily subscribe. . . . There's not much in the way of "news" in this item, save for the fact that Mr. Hubley's remarks were made at one of those meetings where Autocar service men come in from the field to factory, for two conferences each year. . . . During their three days in Ardmore they went over all new developments with factory engineers; they also *brought* something to the factory—the viewpoints of fleet men throughout the country—for study and discussion. . . . Here's hoping the fleet men get what they asked for.

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WHAT, ANOTHER?

• Forgive us, please, if this so-called "column" seems to be degenerating into a parking place for publicity items. So much in the way of really helpful, instructive and constructive literature has passed across our desk in recent months, that it has been difficult to resist the temptation of telling you about them. And what could be a better way of telling you than through this "informal" column, which now fills three pages? . . . Our latest indiscretion, therefore, will be to mention a book which has been called the "most comprehensive and practical one of its kind ever produced." . . . It's the new *"Engine Bearing Service Manual"* produced by Federal-Mogul, written by their chief engineer—not their sales department. . . . The 32 pages of this Manual (8½ x 10½ inches) are just chock full of up-to-date service information on engine bearings, with over 60 illustrations, diagrams and drawings. . . . Briefly, the book attempts to educate your maintenance department on the subject of how to diagnose and correct engine troubles caused by worn or cracked bearings. . . . All types of bearings are illustrated and described, including those used on the Ford V-8. There's a lot of "new-school" information in it on late-type bearings, for "old-school" mechanics, including lots of dope on lubrication. . . . If you want a free copy of this *"Engine Bearing Service Manual,"* which we assure you is a worth-while publication, just drop a line to the Editor and ask for it; or, better still, use the post-card which you will find bound in this issue opposite page 54. . . . There's no obligation, either way, as the Company has printed thousands of copies and is just "dying" for some names to which they can send them. . . . And remember, too, if you please, that we don't mention anything in this column unless we are sure that the thing can bear meticulous scrutiny.

•

A BAD EXAMPLE

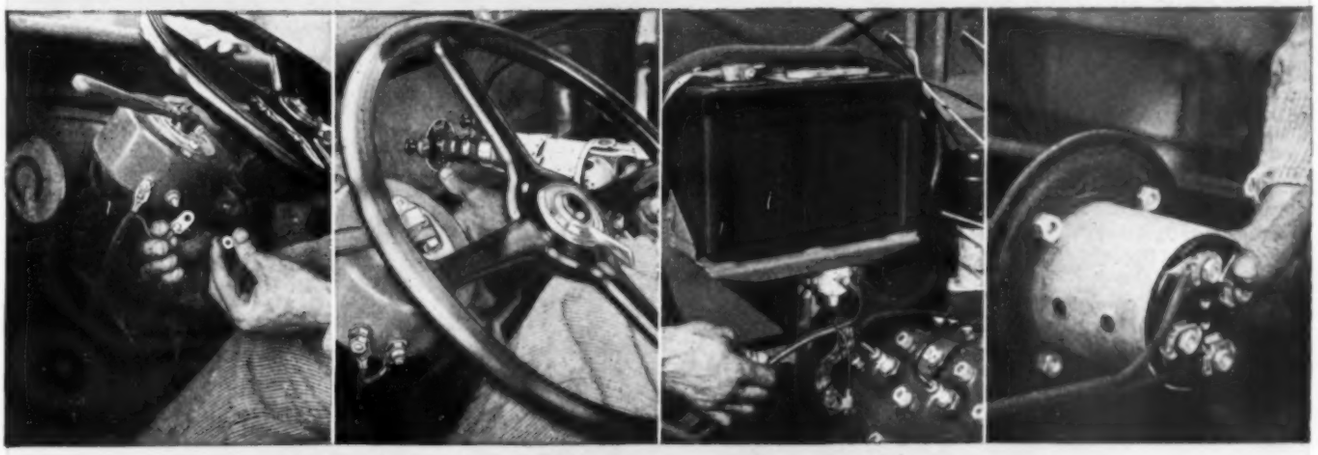
• What's this driver looking at? . . . Whether a parade or a pretty girl, we think it's a swell example of what NOT to do. . . . Direction-signals may be built rugged, but it's a cinch the manufacturers of such equipment never intended them for step-plates. . . . How'd we happen

to get this picture? . . . H. O. Smith, president of Turn-Signal, sent it in to us to show how well he builds 'em. . . . However, it's *his* job to tell you that—not ours—and something tells us we've said too much already. . . . The truck's quite good-looking too; don't you think?

ALL ANY TRUCK NEEDS

For Modern Trailer Brakes

Is In This Little Box!



Just clamp the Controller to Steering Post and attach wires.

Drill hole thru Dash and Mount the Load Control

Run wire to Starter Switch and Ground Terminals

Mount Socket for Connecting Cable and attach Wiring for Brakes and Lights. *That's All!* Just 30 minutes' work.

THE ENTIRE BRAKING EQUIPMENT COMES ALREADY INSTALLED ON TRAILER

WARNER *Electric* BRAKES

Specify Warner Electric Brakes On All NEW Trailers

WARNER ELECTRIC BRAKE MFG. CO. . . . 451 GARDNER STREET . . . BELOIT, WISCONSIN

The Only Power Brakes Designed Expressly for Trailers

The Editor's Column » »

(Continued from Page 16)

SOMETHING ON COSTS

● First cost of a truck is relatively less important than truck operators customarily believe, according to a detailed analysis of the whole subject of truck accounting recently completed by the Autocar Company. . . . This company has encountered many truck owners who had no precise idea of costs of operation, and has for many years provided, on request, a model form of truck accounting. . . . The cost of a truck is reflected in depreciation and interest, which together amount to only 12.25 per cent of the total annual outlay. Drivers' wages and gasoline, on the other hand, represent 56.80 per cent and are roughly the same for all trucks of similar capacities, regardless of first cost. Parts, tires, repairs, oil, and so forth, are items which are smaller in the case of a truck correctly engineered for the job, no matter what the truck's first cost. . . . Elements of truck or tractor operation cost, in order of their size, are found by the Autocar study to be as follows on a percentage basis: Drivers, 35.47; gasoline, 14.69; gasoline taxes, 6.64; depreciation, 11.23; parts, 7.25; insurance, 7.13; tires, 5.03; repair labor, 4.12; housing, 3.05; oil, 1.53; taxes, 1.28; interest, 1.02; supplies (chains, hand tools, soap, etc.), .87; grease, .52; and painting and washing, .17. . . . The one vital fact in truck operation, the company points out, is to carry goods satisfactorily at the cheapest rate per ton. Realization of costs is an essential to ascertaining the correct ton-mile rate of transportation. . . . There's something for you fellows who have been continuously hounding us for information on truck costs.

You May Not Believe It!

(But It's True)

THE FACT:

TALC, the substance of milady's face powder, for instance, although long considered as the basis of comparison when determining "degree of softness" is actually twice as hard as colloidal graphite.

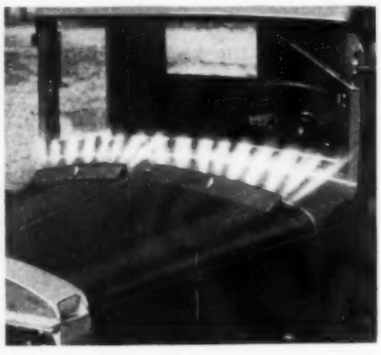
THE PROOF:

THE Smithsonian Institute lists talc as "twice as hard as colloidal graphite." . . . The latter has a rating of 0.5, compared with 1.0 for talc, and 10.0 for the diamond—the hardest substance listed. . . . In other words, colloidal graphite (sometimes used for lubricating the wearing and bearing parts of automotive engines) is twice as soft as the best protective coating for the skin of the fair sex.

NINE of these trailers are now chasing around the country, demonstrating Pedrick and Wilco Products, particularly the Wilco piston expanding machine and Pedrick Hydraulic piston rings. . . . Wilkening factory men and local jobbers are wiping plenty of perspiration from their brows these hot days, but are spurred on by the encouraging receptions they receive from fleet men everywhere.

WINDSHIELD DEFROSTER

● So simple that we wonder why it hasn't been thought of before, is a method of defrosting windshields in winter weather which has recently been patented. . . . As the illustration shows, doors are formed at the



rear end of the engine hood, somewhat on the order of a cowl ventilator, to direct warm air from under the hood directly on the outer surface of the windshield. . . . One thing which has retarded the practicability of this idea in the past, was the long "cowls" which were formerly used. Now that the "cowl" is gradually being eliminated (or at least materially shortened) the thing becomes more feasible. . . . Because of the multiplicity of models required, due to the different curvatures of hoods, etc., the patentee has decided *not* to market the device as an accessory. . . . Rather, he would like to see car, truck and bus manufacturers incorporate the defrosting device in their own hoods, right at the factory. . . . The added cost, he thinks, (and so do we) should not be prohibitive. . . . If the device works out satisfactorily (and we are assured that it does) it would seem that fleet operators should beat a path to the door of the man who offers this mouse-trap. . . . You realize, of course, that no electricity, steam or hot-water is needed in *this* type of defroster. Manual control can be rigged up as simply as it is on present cowl-type ventilators. . . . Consider that we have done our part, Mr. Truck Manufacturer, by calling the matter to your attention in this manner. . . . If you are interested in communicating with the patentee, a line to the Editor will bring his name and address.

●

GIVING YOU A "BREAK"

● As this is being written, we are in the midst of the hottest weather of the summer. But the "show must go on" and who are we to quit work and go swimming? . . . Realizing that the summer weather and vacations sort of mess up things in the routine of one's daily work, we are going to give you (and ourselves) a so-called "break" by refraining from including a new questionnaire in this issue. . . . Our Question-of-the-Month Club will be continued, however, in September. . . . We know that you will appreciate our omitting this department during the summer months, especially since it will remove *one* burden from your shoulders. . . . The good old law-of-averages has taught us not to expect *too* much in the way of questionnaire-returns during the hot weather. . . . So you won't find a new one in this issue. Don't look for it this month, gentlemen; it's just not there. . . . But we'll be back at you in the fall, stronger than ever. . . . And to those who were good enough to answer the last two questionnaires, please have patience if you have not as yet received your mimeographed summaries. These are now in the process of work and will be mailed any day now. . . . Thanks, a lot.

New 1-1½ TON

THE TRUCK OF THE YEAR IS HERE!

A new Diamond T, designed to precisely fit the needs of the great majority of truck operators! At a price well within the lower bracket, this new Diamond T provides: More loading capacity—135-inch wheelbase to take full 10-foot bodies; more carrying capacity—deep X-type frame, oversize steering gear, heavy springs and big full-floating rear axle give it 10,000 pounds gross capacity; ample power, with the exclusive new 221 cubic inch Diamond T truck engine and true Diamond T style! Investigate now.

A GREAT NEW ADDITION TO A GREAT TRUCK LINE

$595

Standard chassis at the factory

SENSATIONAL NEW 1-1½ TON, 135-INCH WHEELBASE GROSS CAPACITY 10,000 POUNDS

DIAMOND T MODEL 301

THERE is no other truck quite like this new Diamond T. It fills a gap which has long existed between the light delivery vehicle and the heavy-duty 1½-ton, which has adequate body capacity but is larger and heavier than needed by the majority of truck operators.

Diamond T dealers now offer a true *truck* in the low-price field . . . long enough for a full 10-foot body . . . more than strong enough for a gross of 10,000 pounds in chassis, cab, body and load . . . more than powerful enough to handle its rated load at steady high speed anywhere. Yet its exclusive new engine is sensationally economical. And it is a Diamond T in every sense of the word.

With the addition of this brilliant new Diamond T 1-1½ ton Model 301, no other line of trucks in America matches the splendid coverage of the market, the closely-priced, high-value quality of every model, which Diamond T offers.

See your Diamond T dealer, or write for new illustrated literature.

DIAMOND T MOTOR CAR COMPANY
Established 1905
Factory and General Offices, West 26th Street, Chicago, Ill.

40 MODELS IN VERSATILE DIAMOND T LINE!

Fifteen Standard Diamond T models range from the ¾-ton Model 80 up to 24,000 pounds gross capacity.

Eight Diamond T Dual-Range axle models and 17 Diamond T 6-wheel models complete the most comprehensive line of fine heavy-duty motor trucks in the industry. Largest of the 6-wheel models provides 40,000 pounds in gross capacity.

Diamond T Style, world-famous and instantly recognizable, is carried throughout.

Recent meeting of U. S. Truck Lines Safety Council attended by the entire staff of managing officials of the companies and divisions comprising U. S. Truck Lines, Inc. William Lawrence, the author of this article, is shown at the head of the table, presiding over the meeting.

Safety Activities *in the* U. S. Truck Lines Fleets

By William Lawrence,

Director of Safety,
U. S. Truck Lines, Inc.

IT became our task several years ago to develop a unified and comprehensive safety program to cover the fleet operations of eighteen divisions and subsidiaries of our company.

Six distinct types of hauling were represented—namely, local cartage, leased fleet operations, local parcel delivery, transportation of new automobiles, common carrier motor freight service, and tank trucks in gasoline transportation. Each type of hauling is handled as a division of our program, which follows the units over more than thirty-six million miles a year, and which is founded upon the following basic factors:

First: Selection training, and supervision of drivers.

Second: Close study of and prompt hearings on each accident.

Third: Reward for safe driving and penalty for carelessness and negligence.

Fourth: Constant emphasis on safety.

Fifth: Regular inspection and maintenance.

Our program is vested in the U. S. Truck Lines Safety League whose membership is made up of virtually all employes. The governing body is the Safety League Council comprised of officials of the company and officers of affiliated companies and their operating departments.

In all our work on safety we strive to keep the individual driver and his problems uppermost in our minds, because it is largely what he does while at the controls that determines the course of our business.

Hiring only good drivers is, as every fleet operator knows, no easy task. Everyone who applies for a driver's job with us is subjected to a thorough physical examination by our doctors. All references and other reliable sources of information are consulted and the man's record well established. If the applicant is of the right age, is physically fit, has a good record, and is of the right type, his application is accepted.

Then comes a course of training which includes all of the phases of his work. He is given a book of rules which govern the conduct of the work, including handling of equipment with which he is to be entrusted. This book sets forth clearly those practices which are looked upon favorably and those which are con-

(*Please turn to p.* 60)

Gold Safety Award

CERTIFICATE

This certifies that _____, an employee

of _____ has been awarded the

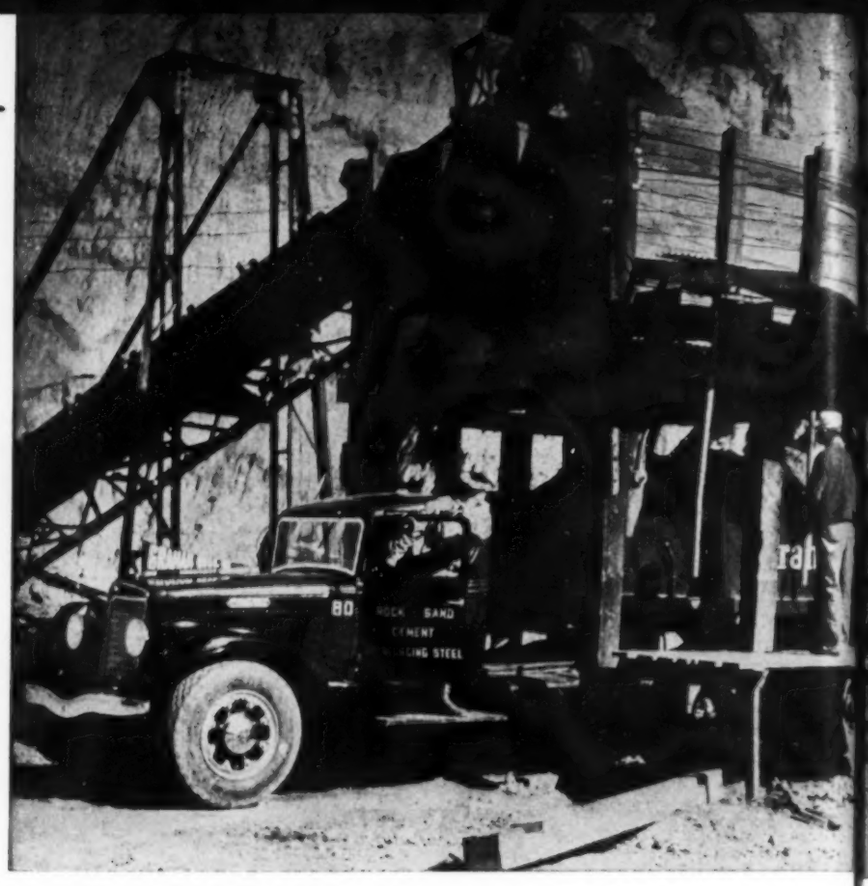
Gold Safety League Button of the U. S. Truck

Lines Safety League in recognition of one year's continuous

record of safe driving.

U. S. TRUCK LINES SAFETY LEAGUE

Here is a facsimile of the certificate awarded, with gold Safety League insignia, to drivers who have completed one year of safe driving.



STANDARDIZATION

AND ENABLES GRAHAM BROTHERS TO

CAREFULLY recorded facts and figures reveal most convincingly the fact that standardization of equipment (including trucks, tractors, semi-trailers and trailers) CAN effect reductions in truck-costs.

TWO years ago a big event occurred in the Pacific Coast automotive world. Graham Brothers, Inc., prominent building-supplies dealers of Los Angeles, Calif., had, with one significant sweep, replaced a fleet of old and varied motor trucks with an entirely new fleet of forty-five Internationals. And then to add to the bigness of the event, the trucks were driven home by Graham Brothers' own drivers over more than half the continent; from the International motor truck plant at Fort Wayne, Indiana, to Los Angeles, Calif. As one headline termed it at the time, it was "The Largest Drive-Away to the Pacific Coast."

Many a news story was published about this spectacular drive-away. The various troubles and vicissitudes that accompanied this unusual caravan are especially remembered by the many who kept up on automotive news. The extended cross-country trip provided a real test.

Because of continually available service, no extra parts were carried, and every truck came through without any mechanical trouble at all, we are told. All units were thoroughly broken-in and ready for immediate pay-load work on their arrival in Los Angeles, according to Graham Brothers.

Now, after two years of heavy, difficult hauling, the grueling kind that Graham Brothers must continually subject their motor trucks to in delivering heavy materials over makeshift roads which so frequently prevail on construction jobs, another story can be told about this interesting motor truck fleet. It's a story based on carefully recorded facts and figures. Most convincingly does it show that standardization pays.

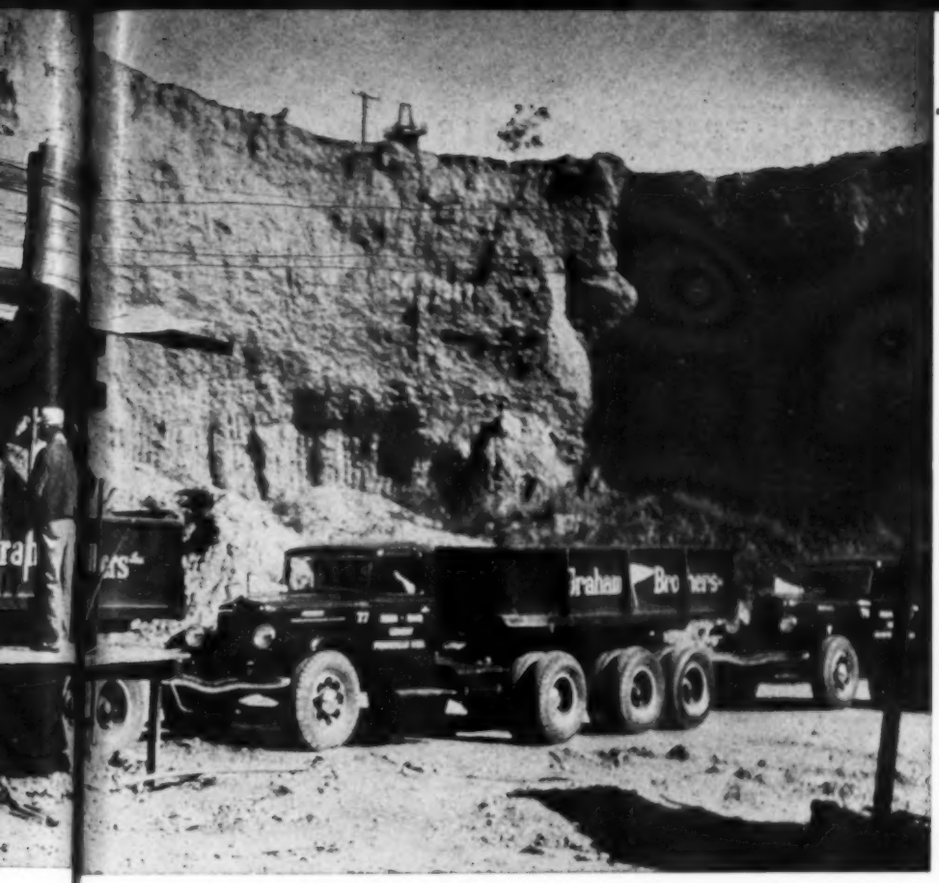
And when we speak of standardization so far as Graham Brothers, Inc., are concerned, we mean standardization in the full sense of the term—standard chassis, standard bodies, standard trailers, standard truck accessories, standard shop and tool equipment, etc.

The fleet now consists of 53 motor truck units, twenty-five of them 2 to 3-ton units, twenty-five 4 to 5-ton units, and three ½-ton pick-ups. Two of the 2 to 3-ton trucks are equipped with flat-bed bodies for hauling cement, four with 2½-yard concrete mixers, and the remainder with 5.8-yard dump bodies.

Most of the larger trucks are operated with trailers, seven of which are of two-axle type. Five 4-yard concrete mixers are mounted on semi-trailers operated by these larger trucks, and five 3½-yard concrete mixers are mounted directly on the chassis of five of these 4 to 5-ton units. Trailers are of both flat-bed and dump type.

As is the case with bodies mounted on the chassis, a change can easily be made from dump or flat-bed or vice versa, as extra business in one kind of hauling or another necessitates a change. All of these trucks and trailers are painted an attractive, attention-getting blue with lettering in aluminum.

The firm was established in a modest way in 1909 by two brothers, Paul C. Graham, now president of the concern, and his deceased brother, Robert. Materials in those days were hauled in six horse-drawn dump wagons. The first motor truck was purchased



PAYS DIVIDENDS

MAKE REDUCTIONS IN TRUCK COSTS

An Interview with
Paul C. Graham, Pres.,
Graham Brothers, Inc.,
Los Angeles, Calif.

in 1911. The business of the concern steadily increased and so motor trucks were now and again added to keep up with these increases.

Graham Brothers are now among the largest distributors of cement, concrete aggregates, batched concrete, and reinforcing steel in southern California. Their selling territory is roughly within a radius of 300 miles of Los Angeles—from north of Bakersfield down to the Mexican border. They operate seven big rock-crushing and gravel plants and maintain batching plants in Los Angeles and Long Beach.

As so often has been the case when a fleet is gradually built up like that of Graham Brothers, Inc., motor trucks of various makes and types are acquired. Often units are maintained in service longer than it would be profitable to replace them with new models. Just before the big drive-away two years ago, there were twelve different makes of trucks in the fleet, and most of the units were either out of date or had seen so much hard and continued service that their operating costs were way out of bounds.

Upkeep costs averaged 12 to 15 cents a mile as against 3 cents per mile for units of the standardized fleet. A cost of $500 for a motor overhaul was nothing unusual as against an average of $110 at present. Of course, removable cylinder liners in the later trucks have eliminated cylinder regrinding and are partly responsible for keeping this expense item down. Some $15,000 had to be regularly invested in repair parts to keep the twelve varieties of old trucks in continual service as against only $2,500 at present for the standardized fleet.

More economical, more efficient, and safer driving is also made possible with standardized units, asserted Martin Brogan, superintendent of transportation. With the former fleet it was frequently necessary to train a driver anew when he was shifted from one old model to another. Similarly, in the shop, since the standardization program was inaugurated, mechanics do better, faster, and more efficient work at less cost.

In the office it has been possible to maintain closer check on each truck, a better statistical picture as it were, because the data are so much easier to obtain. Finally, standardization has enabled Graham Brothers, Inc., to plan and route deliveries with much greater efficiency.

Selection of drivers by Graham Brothers, Inc., is greatly simplified by the fact that Bert Blower, shop and garage foreman, who does the hiring, has been with the company a long period, part of the time as a driver, and knows practically every man in the business in southern California. He used to drive trucks as early as 1910.

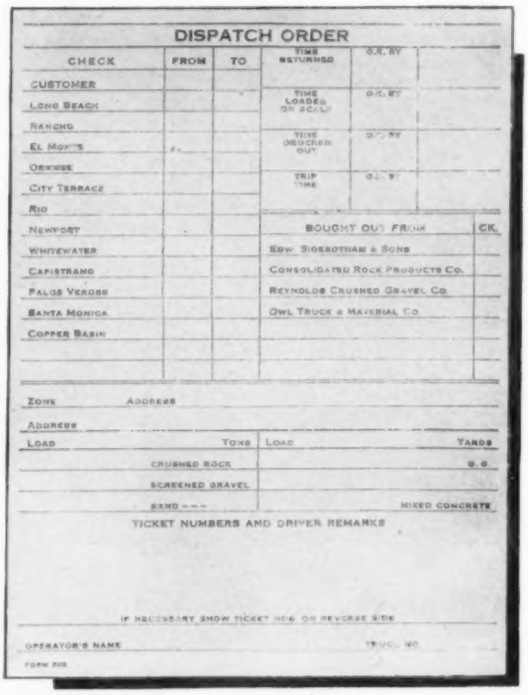
Mr. Blower's long experience and wide acquaintanceship among truckmen enables him to do a good job of sizing up prospective drivers and selecting men who make good.

A merit system has been established to further the interest of drivers in their work and monthly cash prizes based on safety record, truck earnings, condition of truck, willingness to work, etc., are awarded.

(*Please turn to page* 24)

Graham Brothers, Inc., maintain an up-to-date shop and garage 50 feet by 100 feet in size in Los Angeles, where all their equipment, including trucks, is regularly repaired and overhauled. Nine mechanics are employed, four of them devoting their time entirely to automotive work.

Check of the work done and the cost of operating and maintaining each motor truck in the Graham Brothers, Inc., fleet is carefully kept by means of a number of special bookkeeping forms. Whenever a delivery is to be made, a dispatch order blank (8¼ inches by 4½ inches in size) is first filled out. One of these blanks is reproduced in an accompanying illustration. In the first column are listed various crushing plants and a check mark in the next "from" column indicates where material was obtained.



DISPATCH ORDER

CHECK	FROM	TO	TIME RETURNED	O.K. BY
CUSTOMER				
LONG BEACH			TIME LOADED ON SCALE	O.K. BY
RANCHO				
EL MONTE			TIME ORDERED OUT	O.K. BY
ORANGE				
CITY TERRACE			TRIP TIME	O.K. BY
RIO				
NEWPORT			BOUGHT OUT FROM	CK.
WHITEWATER			EDW. SIDEBOTHAM & SONS	
CAPISTRANO			CONSOLIDATED ROCK PRODUCTS CO.	
PALOS VERDES			REYNOLDS CRUSHED GRAVEL CO.	
SANTA MONICA			OWL TRUCK & MATERIAL CO.	
COPPER BASIN				

ZONE ADDRESS

ADDRESS

LOAD	TONS	LOAD	YARDS
	CRUSHED ROCK		
	SCREENED GRAVEL		
	SAND		MIXED CONCRETE

TICKET NUMBERS AND DRIVER REMARKS

IF NECESSARY SHOW TICKET NOS. ON REVERSE SIDE

OPERATOR'S NAME TRUCK NO.

FORM 205

Dispatch order-blank, used whenever deliveries are made. Five copies are made—for driver, customer, transportation department, dispatcher's file and central office.

Five copies of this dispatch order are filled out respectively for driver, customer, transportation department, dispatcher's file, and central office. The customer is asked to sign the driver's form after delivery has been made. Time leaving plant and returning is recorded on dispatch order by time clock. These records of time must be approved by dispatcher before they can be considered for payment of driver wages.

Another form (11 inches by 8½ inchs in size) for keeping track of garage work is shown. This is made out in triplicate, the third copy being on heavy yellow paper for the garage; the other two copies are respectively for office and plant.

Information is transferred from the forms shown and other forms to heavy "daily truck report" sheets 9 inches by 11 inches in size. One of these sheets is made out for each truck and when completely filled shows a record in detail for one truck for an entire month.

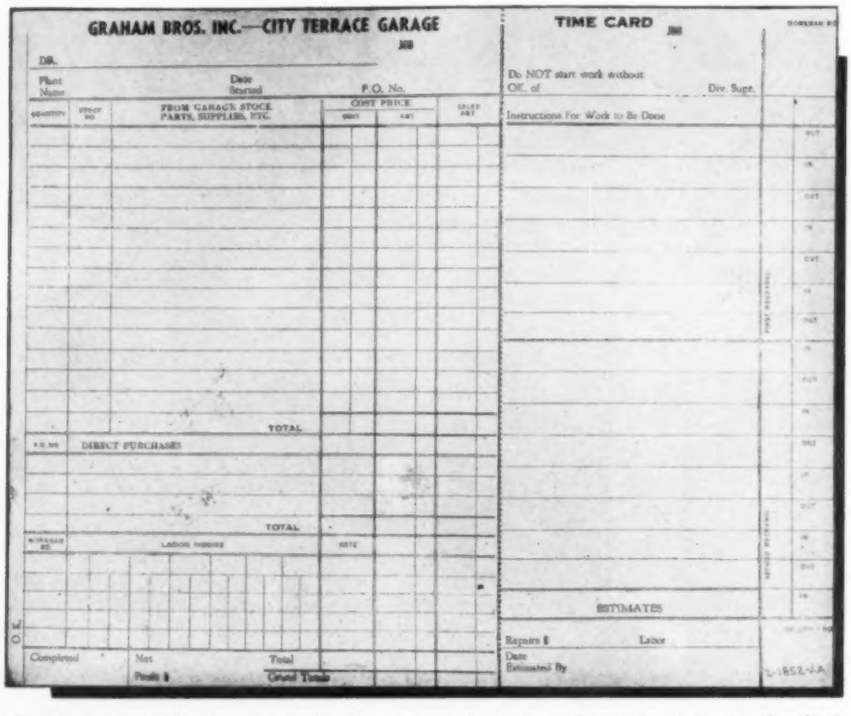
At the top of this "daily truck report" sheet are spaces for truck number, month, and name of operator. At the left are columns respectively for date, prorated items (prorated over a fixed period), tires, job number, and fixed charges.

Under "maintenance and operating expense" are columns for recording data on gas and oil consumption, parts and repairs, shop labor, tire maintenance, general overhead, cost of accidents, prorated expense, greasing, hours, driver wages, and total.

Finally, under "mileage and earnings," are the following columns: hours, yards or tons, total revenue miles run, ton mile cost, profit, and loss.

Besides Paul C. Graham, president, who was previously mentioned, officials of Graham Brothers, Inc., are as follows: Carder Livingston, vice president; H. F. Q. Pelsue, vice president; and William Cook, secretary and treasurer.

(EDITOR'S NOTE: In case you are interested, this publication was one of those mentioned in the second paragraph of this article, which published a news story announcing the purchase of an entirely new fleet by Graham Brothers, Inc. . . . That was back in April, 1935; the article appeared on page 34 and was entitled: "There's Confidence on the Coast." The story included a rather detailed description of the new fleet and gave full information as to the equipment used.)



GRAHAM BROS. INC.—CITY TERRACE GARAGE

DR.

JOB

Plant Motor | Date Started | P.O. No.

QUANTITY	STOCK NO.	FROM GARAGE STOCK PARTS, SUPPLIES, ETC.	COST PRICE UNIT	COST PRICE AMT.	SALES AMT.
		TOTAL			
P.O. NO.		DIRECT PURCHASES			
		TOTAL			
WORKMAN NO.		LABOR HOURS	RATE		

O.K.

Completed | Net Profit $ | Total Grand Total

TIME CARD

JOB

Do NOT start work without O.K. of Div. Supt.

Instructions For Work to Be Done

OUT / IN

ESTIMATES

Repairs $ Labor

Date Estimated By

L-1852-V-A

This form is used for keeping track of garage work. It is made out in triplicate, the third copy being on heavy yellow stock for garage. The other two copies are for office and plant.

WESTINGHOUSE
GENUINE
AIR BRAKES
THE
WORLD'S FINEST
CONTROL
IS BY FAR THE LEAST
EXPENSIVE
In genuine Westinghouse Air Brakes the modern commercial operator finds his cost per mile greatly reduced due to three important factors... LOW FIRST COST... UNPARALLELED PERFORMANCE and EXCEPTIONALLY LOW UPKEEP which is guaranteed by a universal system of factory regulated maintenance costs • Consider these three points carefully when specifying brake control . . . check with any of the thousands of operations that are showing notable economies with genuine Westinghouse Air Brakes or, make your own comparisons • An intelligent organization of Bendix-Westinghouse distributors and district offices, located in key cities throughout the United States and Canada is waiting to serve you.
BENDIX - WESTINGHOUSE
AUTOMOTIVE AIR BRAKE CO.
PITTSBURGH • PENNSYLVANIA
Other genuine Bendix-Westinghouse products include Air Clutch Control, Air Gearshift Control, Air Steering Control and a dependable Air Warning Signal.
★ Priced slightly higher in Canada and foreign countries.
AS LOW AS $139.00* INSTALLED
Genuine
WESTINGHOUSE AIR BRAKES

Because it relieves the monotony for drivers on long trips, radio is considered a safety feature on trucks of the Patrick Transfer & Storage Company, Houston, Texas. The radio-equipped Ford V-8 truck-tractor shown above participated in rolling up a splendid safety record for the company.

Beats Safety Record—Loses Contest!

SOUNDS like a "Ripley", a paradox, and all that sort of thing, but it's an interesting, true story, and Fisher Dorsey is stuck with it . . . Here is a case where it's not so bad to be an "also-ran".

THIS is a story about an "also-ran" in the recent safety contest conducted by American Trucking Associations, Washington, D. C.

Fisher G. Dorsey, Houston, Tex., a winner in the 1935 ATA contest, entered the 1936 event with a safety record far superior to that which gave him a first prize the previous year. But other fleet operators had *better* records and Dorsey received only honorable mention.

The foregoing statement might appear to be highly unimportant, leading some to ask, "So what?" Its real significance is this:

It discloses that the very safety standards themselves for which the members of the Association are working, are being pushed higher and higher each year.

It proves that a concerted drive by truckers in the interests of safety will get results.

It reveals that the goal toward which the trucking industry is resolutely moving is attainable because it has already been attained by many fleet operators.

A ranking vice-president of American Trucking Associations and a leader in the affairs of the organization since its inception, Fisher G. Dorsey operates the Patrick Transfer & Storage Company of Houston, Texas. He also owns a wharf terminal and operates a forwarding company there.

Mr. Dorsey feels that his safety endeavors are paying him big dividends. His trucks have traveled several hundred thousand miles without a serious accident. The saving on insurance as a result of this brilliant record totals many hundreds of dollars annually and will increase in years to come. Accident repair costs have been practically eliminated. Dorsey finds, too, that much new hauling business has been attracted by his safety record.

How does he do it? Perhaps the best answer would be that he does everything that needs to be done to accomplish his objective.

Dorsey's safety activities are not limited to their trucks but extend to their shipping and receiving platforms, also. . . . Note that his men handle materials with proper posture.

"We rule our drivers and helpers with an iron hand but the men appreciate it. They are just as proud of the record as I am," states Dorsey.

"A man must be safe in *every* respect to drive for us. A man who lets himself get injured about the shops eliminates himself as a candidate for a driving job for he is the one who is likely to be careless on a truck. Here is our system for keeping tabs on driver-performance:

"A man who drives a month without an accident receives a gold star. He gets a pin for driving 12 months without an accident. I have six drivers who have completed 12 months without an accident. A man who has an unavoidable accident gets a blue star. A man who has a chargeable accident gets a red star and is laid off without pay while his truck is being repaired. All new equipment goes to gold star drivers.

"We hold a safety school at least once each week. Accidents (if any) are carefully analyzed and ways and means are pointed out for avoiding them. We also set up tight places to see how drivers will get out of them. Through continuous study of this kind, our drivers soon learn what to do in emergencies.

"Road trucks carry two men and are equipped with radios. Drivers are less likely to get drowsy when they can listen to radio programs and they don't get on each

(*Please turn to page* 68)

"Saves 18% Gasoline
Saves 25% Oil
Saves 10% Time
Gives ⅓ Longer Life"

Showing type of truck equipment used by Tom Hicks Transfer Co., Inc., West Monroe, La.

Motor truck transportation presents unusual load problems in Louisiana. Here, many varied products such as sugar cane, rice, cotton, lumber, petroleum and sulphur must be hauled to shipping points. Here, too, heavy farm and industrial equipment frequently must be hauled to off-main-highway points.

But according to the records of the Tom Hicks Transfer Company, Inc., the Ruckstell 2-Speed Axle makes *any* truck perform *more* satisfactorily and *more* economically in *every* kind of trucking service.

The Ruckstell 2-Speed Axle has a gear ratio to suit any road or load condition—offers quick, quiet selection of 8 forward speeds and 2 reverse. Starts heavy loads without bucking or frogging. Makes hill climbing easier. Gives more profitable speeds on level roads—quicker getaway in heavy traffic.

And, according to Tom Hick, a Ruckstell-equipped Truck gives ⅓ longer life—saves 18% in gasoline, 25% in oil, and 10% in time. Surely *here* is a case history worthy of investigation by any individual or corporation engaged in trucking—whether for service-convenience or money-profit.

EATON MANUFACTURING CO. • CLEVELAND, OHIO

PHONE 94

Tom Hicks Transfer Co., Inc. PHONE 480

"A TRUCK FOR EVERY PURPOSE"

WINCH TRUCKS — DERRICK TRUCKS
RIG MOVING AND PIPELINE HAULING
HEAVY HAULING — LONG DISTANCE HAULING
WEST MONROE, LOUISIANA

New Orleans Equipment Co., April 22, 1937
400 Jackson Ave., New Orleans, La.

Gentlemen:

The Eaton-Ruckstell axles we have in our 1½ ton trucks give us not only the power that we would get in a 2½ ton truck, but make our trucking expense less than it would be with a 1½ ton truck without the Ruckstell.

Recently we backed the rear wheels of a semi-trailer down into a ditch in order to load a Bull-dozer mounted on a 60 Diesel Caterpillar and pulled this load out of the ditch with ease.

Our savings by having the Ruckstell axle in our trucks are:

18% in gasoline
25% in oil
⅓ longer life of the truck
10% in time.

We unhesitatingly recommend Ruckstell Axles to all users of trucks as we have used them over a year and have not had one moment's trouble with them.

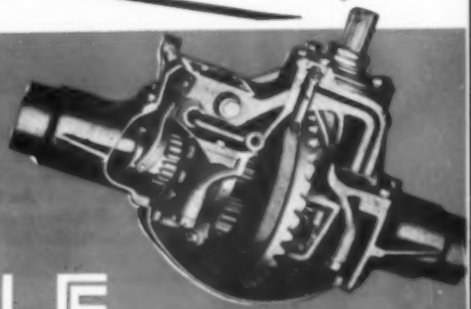
You may use this letter for any purpose that you see fit.

Very truly yours,

Tom Hick, Manager

EATON
2 Ruckstell SPEED AXLE

with New Eaton Forced Flow Axle Lubrication



8 Speeds Forward —and 2 Reverse

"OIL-FILTERS" P

• IN THIS, A PARTICULARLY DU

IN WHICH a "super" states the case FOR the use of oil-filters, based on what he considers a FAIR test, over a period of 19 months (or 22,000 miles) on a truck regularly used in his fleet.—H. C. F.

AT the mention of "dust," the average reader is apt to conjure up a mental picture of great clouds of eroded top-soil billowing across the plains of the middle-west or south-west; or perhaps of the yellow "smoke-screen" laid down by a flock of five-tonners "batching" on a road job. However, even in comparatively clean operation on city streets, we all know that the toll collected from automotive engine performance, due to particles of atmospheric dust being drawn into them through crankcase openings and carburetors, is a heavy one.

In our own particular operation, the quantity of coal, yes coal, (in the form of finely divided slack or "bug-dust") which finds its way into the interior of our motors is almost unbelievable to those not acquainted with actual conditions around a coal tipple.

"True, this coal-dust is not as harmful as many other substances, in that it is only *mildly* abrasive. On the other hand, it collects as carbon in combustion chambers and behind piston rings; it gums-up valve-stems and seems to quickly combine with the oil to form a thick sludge.

That this sludge is harmful there can be no doubt. Aside from any chemical effect it *may* have on the oil or engine parts, in aggravated cases it clogs or partially clogs the oil-screens and oil-lines and even in mild cases the oil soon becomes thick and sluggish.

Under such conditions lubrication is noticeably impaired. For years our only remedy was to change the oil frequently and to periodically dismantle and clean the engines. Oil-filters were tried at various times but found only slightly helpful—not enough in any case to justify keeping them on the job.

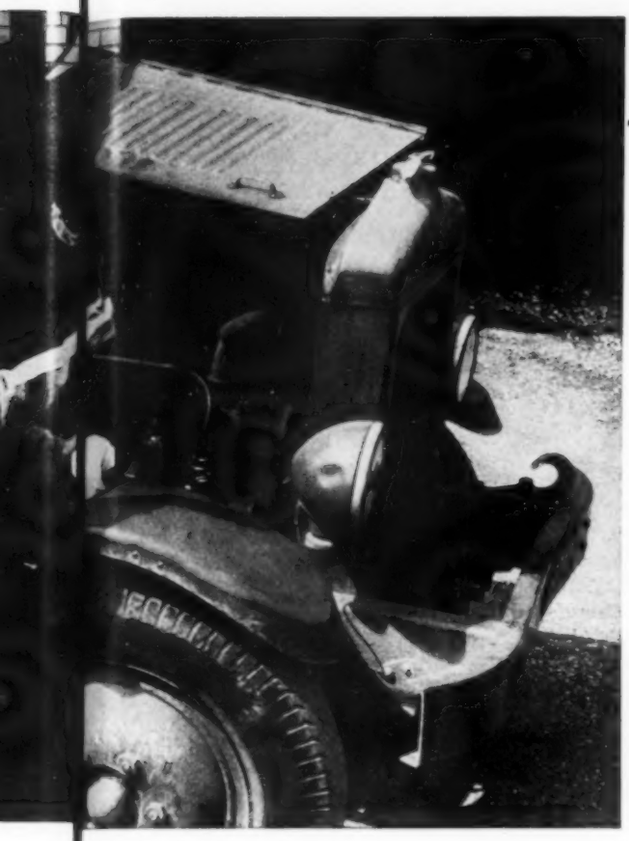
When the "modern" type of oil-filter was placed on the market a few short years ago, we were somewhat skeptical as to its worth on our especially tough job of oil cleaning, but finally, in December 1934, we decided to put one of them in operation and "give it the works."

The truck selected for the experiment was a two-ton job used regularly in short-haul, retail deliveries. Although of rather ancient vintage, this truck had recently been stepped up by the installation of a new 6-cylinder engine of (at the time) modern design. The engine (before the filter installation) had been in operation about 8,000 miles and aside from the regular tune-ups, no work of any kind had been performed on it. Sludge had become somewhat troublesome and valves had begun to show evidence of sticking slightly, although not as yet requiring attention.

THIS is the truck used for the oil-filter test described in this article. . . . The driver (shown in the picture) checked the oil-level daily. . . . The object on the dash, just above the driver's hand is NOT the oil-filter. . . . It looks like the vacuum-tank to us. . . . All clues as to make of filter are purposely eliminated from this article.—Editor.

Up to this time oil had been changed at more or less regular intervals ranging from 500 to 1,000 miles. In order to determine the efficiency of the oil-filter beyond any reasonable doubt, we decided to run a "no-oil-change" test for as long a period as possible or convenient. Acting on the manufacturer's instructions, we first replaced several cartridges at intervals of a day or two.

Much to our surprise, the oil became gradually clearer and at the end of a week it had taken on the *appearance* of new oil. From this point on, we replaced cartridges only when the oil, as shown by the



PROVE *their* WORTH

DUSTY FLEET OPERATION •

By John L. Lyden,
Maintenance Superintendent,
The Phillips Brothers Coal Company,
Pittsburgh, Pa.

gauge-stick, became noticeably dark. This was necessary at various intervals, ranging from 500 miles to as high as 2,000 or more.

During June 1936, or after a time-interval of some nineteen months or approximately 22,000 miles of operation, the engine was dismantled for inspection and possible repairs, although it was still in apparently good operating condition, having as yet required only routine care. Oil consumption still remained low and no further valve trouble had been experienced.

In the meantime, of course, oil was added in the usual manner to keep the level correct, the average consumption being in the neighborhood of three quarts to 500 miles or possibly a little better, which is somewhat lower than our average for a job of this type; this, however, we do not necessarily attribute to the presence of the oil-filter.

In addition to watching the oil for color indications, several samples were tested at intervals with the following results:

Viscosity showed a slight increase at first and later dropped somewhat, but at no time below 60 @ 210° as compared with 74 for new oil of the same grade and make used.

Gravity apparently remained within a point or so of that of new oil.

Fire-point dropped from 525° to 450° and apparently remained close to that point.

Flash-point showed the greatest variation, dropping from an original of 465° to 260° and apparently remaining fairly constant thereafter.

Dilution varied from 3% to 5%, which may be considered as low, although dilution is more or less dependent upon operating conditions, and is no indication of oil-filter efficiency, at least within certain limits.

The lowering of flash and fire-points, too, is a natural result of dilution and probably occurs within a short time after the oil is placed in the crankcase. Theoretically, a lowering of the flash-point should mean greater oil consumption and possibly greater upper cylinder-wall wear, but in this case, as the final results will show, the low flash-point apparently meant little in the performance of the oil. Quite possibly our changing the oil has had little effect on the average of any of these figures over a period of time.

Tests also showed the absence of any solid matter and only a very slight amount of water, although all samples were taken from a cold crankcase. Water, when present, was apparently removed by the filter, as appreciable quantities were drained from the sump of the filter on one or two occasions.

On inspection in June of 1936, after the engine-mileage (total) had run up to 30,000 miles, and the oil-mileage (without change) amounted to 22,000 miles, the following items were checked and found as noted:

Valves—Condition, good; no gummed stems.

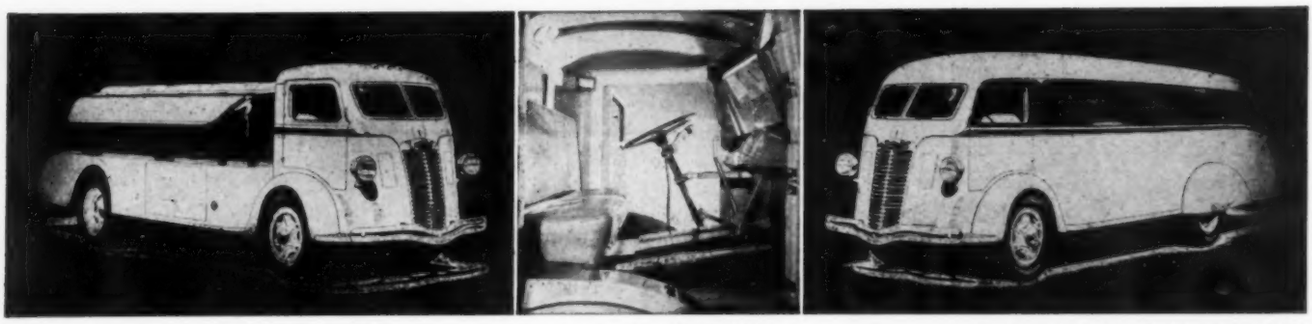
Piston Rings—Condition, good; wear, normal; the rings were replaced with new ones at this time.

Pistons—Condition, good; about .001″ wear.

Cylinder Walls—Condition, good; about .005″ wear; this is less than normal.

(Please turn to page 60)

HERE is one of Phillips Brothers' coal trucks that is operated without an oil-filter. . . . To quote the author of this article, "To change or not to change—that is the question always confronting us when a good oil-filter is not on the job". . . . Here he is shown pondering over the condition of the oil in the crankcase, wondering whether to change.—Editor.



ARTIST'S DRAWING OF TYPICAL C.O.E. JOB — FIG. I—CAB-OVER-ENGINE — ANOTHER TYPICAL ARTIST'S DRAWING

The Case *for the* "Camel-Back" » »

IN WHICH a truck engineer (B. B. Bachman of Autocar) advances several engineering features in support of the "Camel-Back" motor truck . . . Personally, we prefer the name "Cab-Over-Engine" but then there is "Engine-Under-the-Seat" and "Cab Forward" to reckon with; so this discussion should prove somewhat enlightening.

THIS writer was asked, recently, to prepare a paper for reading before the Southern California Section of the Society of Automotive Engineers. The title of the paper was assigned in advance by members of the S.A.E. Committee, it being *"Engineering Facts in Support of the Camel-Back Truck."* The term "Camel-Back" is neither descriptive nor euphonious and is consequently inappropriate; however, the writer was obliged to adopt it, although with considerable reluctance.

Two names, "Engine-Under-Seat" and "Cab-Over-Engine" are descriptive of the two general types of short wheelbase vehicles which are being produced by various truck manufacturers at the present time. (Cab-Forward is another popular term.—Ed.)

In the Cab-Over-Engine type, illustrated in Figure 1 at the top of this page (center), it can be seen from the inside-cab view that the engine is located adjacent to the front end of the chassis; it projects upward through the floor-boards and extends ahead of the front axle.

In the Engine-Under-Seat type the engine is actually located under the seat, as shown in the lower illustration on this page (Figure 2). In this type of construction the engine and the front axle are approximately in the same location, in relation to each other, as they are in the "conventional" truck chassis.

So that this discussion cannot be considered "biased," may I state that the company which I represent builds both types. The Engine-Under-Seat design is used in our heavy-duty units where the engines, transmissions and rear axles are of our own design and manufacture. The size of the engines used in these heavier units is such that if they should be mounted forward, they would either crowd the driver or require a very wide cab. Mounted under the seat, the only encroachment on the driver or helper is a narrow tunnel which affords a passage for the water-outlet pipe and also an air passage from the fan to the engine compartment. It is obvious that this construction calls for some detail modification of the engine, transmission and rear axle which we, as the maker of these parts, can control.

On our lighter units, where cost considerations are of great importance, we use the Cab-Over-Engine construction. Here the engines are smaller and can be conveniently housed and we can use standard production-run engines, transmissions and axles which, if they were changed to meet the reqirements of the Engine-Under-Seat type, would cost considerably more.

The considerations which affect this problem are evident; their advantages enumerated as follows:—

1. Shorter overall length, conserving space—garages—ferries—parking, etc.
2. Shorter wheelbase, making turning easier due to smaller turning-circle.
3. Improved weight-distribution.
4. Reduced frame stresses.
5. Distinctive appearance.

(*Please turn to page* 60)

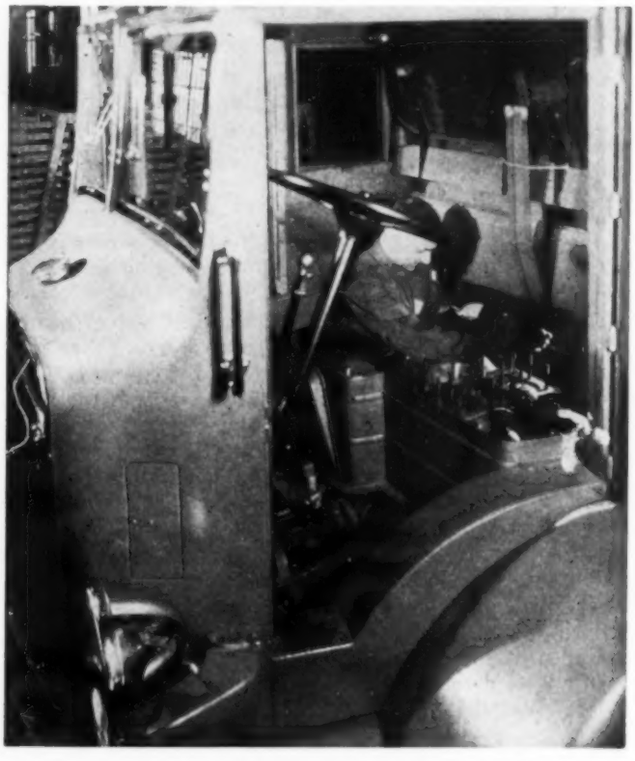
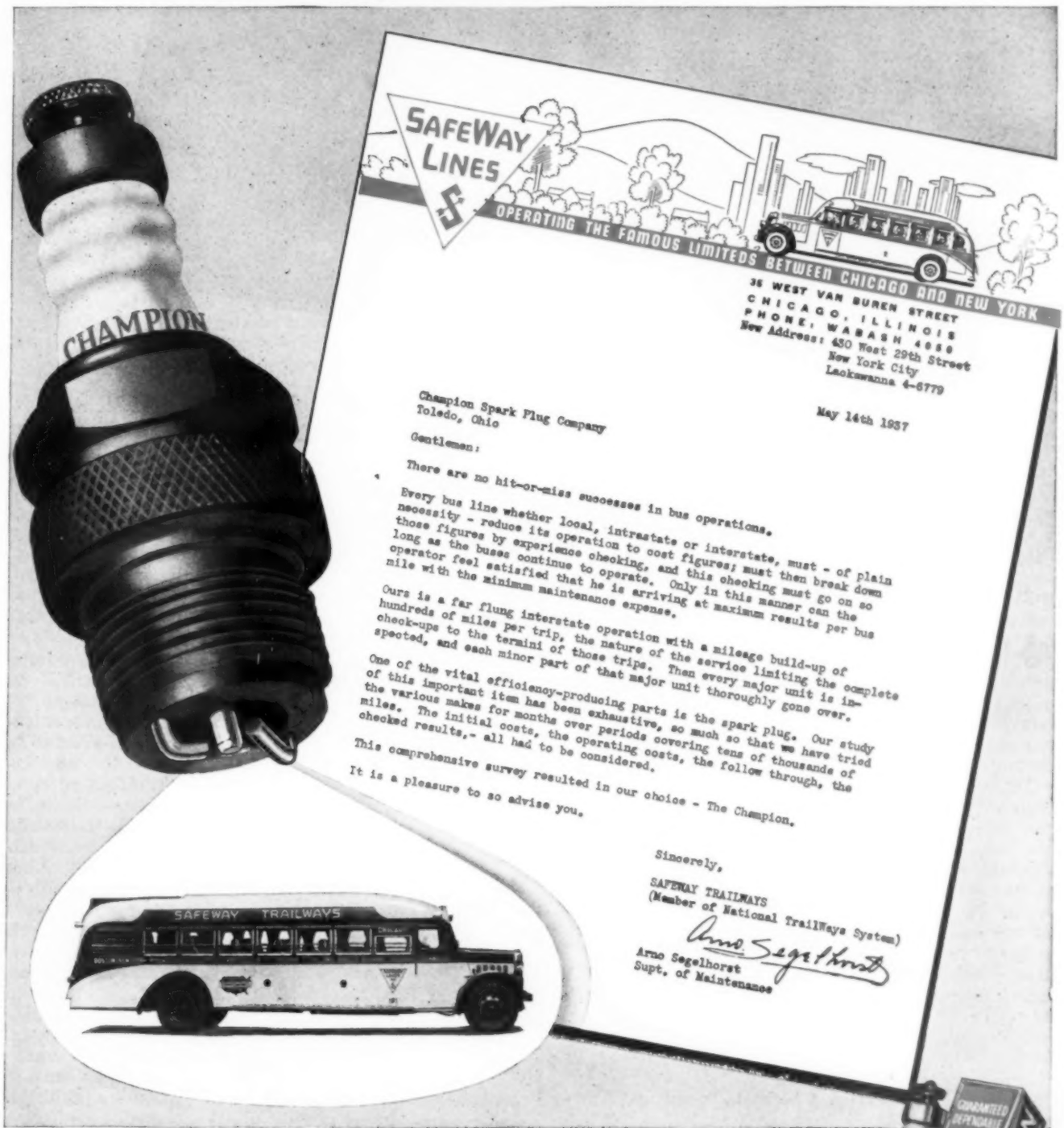


FIG. II—CLOSE-UP OF TYPICAL "ENGINE-UNDER-SEAT" JOB

Successful Fleet Operations Depend on Spark Plugs

YOU CAN DEPEND ON CHAMPIONS


CHAMPION
SAFEWAY LINES
OPERATING THE FAMOUS LIMITEDS BETWEEN CHICAGO AND NEW YORK
35 WEST VAN BUREN STREET
CHICAGO, ILLINOIS
PHONE: WABASH 4868
New Address: 450 West 29th Street
New York City
Lackawanna 4-6779
May 14th 1937
Champion Spark Plug Company
Toledo, Ohio
Gentlemen:
There are no hit-or-miss successes in bus operations.
Every bus line whether local, intrastate or interstate, must - of plain necessity - reduce its operation to cost figures; must then break down those figures by experience checking, and this checking must go on so long as the buses continue to operate. Only in this manner can the operator feel satisfied that he is arriving at maximum results per bus mile with the minimum maintenance expense.
Ours is a far flung interstate operation with a mileage build-up of hundreds of miles per trip, the nature of the service limiting the complete check-ups to the termini of those trips. Then every major unit is inspected, and each minor part of that major unit thoroughly gone over.
One of the vital efficiency-producing parts is the spark plug. Our study of this important item has been exhaustive, so much so that we have tried the various makes for months over periods covering tens of thousands of miles. The initial costs, the operating costs, the follow through, the checked results,- all had to be considered.
This comprehensive survey resulted in our choice - The Champion.
It is a pleasure to so advise you.
Sincerely,
SAFEWAY TRAILWAYS
(Member of National TrailWays System)
Arno Segelhorst
Supt. of Maintenance
SAFEWAY TRAILWAYS
GUARANTEED DEPENDABLE
CHAMPION

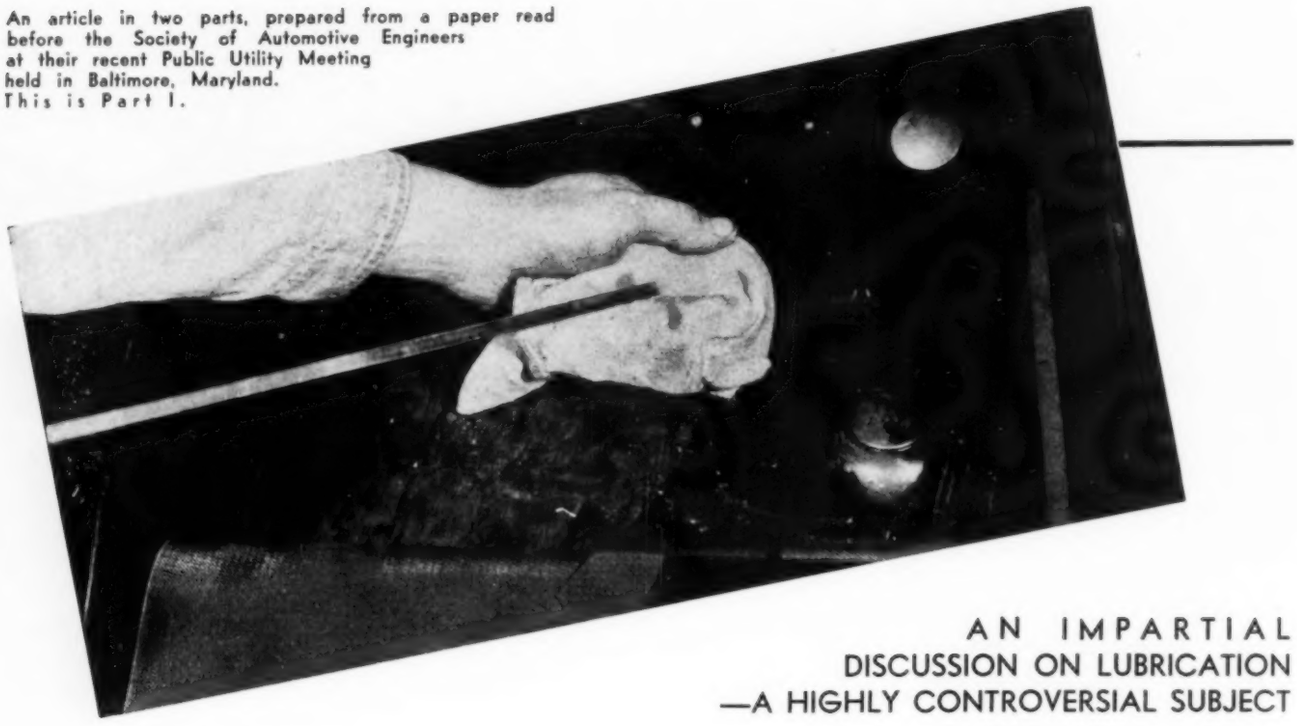
This letter so perfectly expresses, from practical experience, the importance of spark plugs in successful fleet operations, that Champion reproduces it exactly as written, with thanks to Safeway Trailways and Mr. Segelhorst.

CHAMPION

EXTRA-RANGE SPARK PLUGS

CHECK AND CLEAN SPARK PLUGS WHEN YOU CHANGE OIL

An article in two parts, prepared from a paper read before the Society of Automotive Engineers at their recent Public Utility Meeting held in Baltimore, Maryland. This is Part I.



AN IMPARTIAL DISCUSSION ON LUBRICATION —A HIGHLY CONTROVERSIAL SUBJECT

FLEET LUBRICATION PROBLEMS

By James I. Clower,

Associate Professor of Machine Design, Virginia Polytechnic Institute, Blacksburg, Va.

FLEET operators generally recognize the fact that motor vehicles must be not only mechanically well cared-for, but also correctly lubricated in order to insure minimum cost per unit for safe and dependable operation. In other words, that correct lubrication plays an important part in economical fleet operation.

Let it be understood that correct lubrication means not only the selection of the most suitable oil for the vehicle at hand but also the use and care of the oil while in service. I am afraid some operators take it for granted that correct lubrication implies only the selection and that the problem is solved when the most suitable oil has been selected. This article has to do mainly with the care of the oil while in service, which is, in my opinion, as important or more so than selection.

Practically ever since the advent of the motor vehicle, it has been generally observed that crankcase oil undergoes during use, both physical and chemical changes. This is of great importance because the useful life and operating cost are largely dependent on maintaining the oil in such a condition as to render effective and economical lubrication at all times.

The most generally accepted method of circumventing oil changes has always been to drain the crankcase after either a specified number of miles of operation or period of time. For obvious reasons, there has never been nor is there at the present time a common agreement among the interested parties as to the mileage beyond which it is not advisable to use oil.

Not many years ago it was common practice to drain crankcase oil at intervals of 500 miles; today, the general practice is to drain at 1,000-mile intervals. The fact is, however, that at present there is no reliable scientific method or test by which it is possible to determine whether or not an oil is suitable for further use.

Considerable research has been conducted by various individuals, companies, institutions and others in an endeavor to establish a reliable criterion for judging the useful life of crankcase oils, but the success thus far achieved has not been outstanding, although the effects of service on the properties of crankcase oils have been pretty well established by this time.

Oil technologists and other experts have known for many years that lubricating oils do not wear out, as many laymen believe. They simply become contaminated with various impurities, the removal of which, renders the oil suitable for further service. Some authorities hold that properly reclaimed oils are better lubricants than new oils, and the results of some tests support this claim.

Before attempting a discussion of the devices that have been produced for purifying oils while in ser-

vice, it may be helpful if we consider somewhat in detail the factors or elements that tend to produce changes in the characteristics of crankcase oils while in service. These factors or elements are generally spoken of as impurities.

Sources and Nature of Impurities: For the purpose of discussion, impurities commonly found in crankcase oil may be grouped into two major divisions as follows:

(a) *Inherent impurities,* which include substances (1) that are chemically formed in the oil while in service; (2) those that are present in the crude from which the finished oil is made and have not been completely removed during the refining process; (3) those that are introduced in the refining processes and not completely eliminated in the finished product.

(b) *Extraneous or foreign impurities,* which get into the oil either during storage or while in service.

I believe that the majority of lubricating experts will agree if an oil, regardless of the base and refining methods employed, is placed in a perfectly clean crankcase of an engine and if no outside impurities are allowed to enter, that it would still undergo some changes. Obviously, then, impurities are either present in the original oil or else develop while in service. Doubtless, both conditions exist. Crude oil contains many impurities, such as water, various kinds of solid particles, complex sulphur compounds, oxygen and nitrogen and other gases, and some unstable, complex hydro-carbons which oxidize readily and hence must be considered impurities.

In the process of refining the oil is frequently intimately mixed with various solvents, acids, alkalies, water, and air.

Regardless of the care exercised in the refining processes, some of these-so-called inherent impurities remain in the finished oil. The extent to which they are present in the finished product, of course, depends on the care exercised by the manufacturer. Today no reputable refiner permits his product to leave the plant containing free acid, alkalies, water, etc., and it is safe to say that when oil is purchased from a reputable manufacturer it is practically free from such impurities.

By far the most serious and important inherent impurities are those that develop through chemical changes while the oil is in service. In general those are products of oxidation (commonly called asphaltenes) and are derived from the unstable hydrocarbons. The fact must not be lost sight of, however, that while most oils are practically free from refining chemicals, yet a mere trace of any one of these chemicals may, in the presence of extraneous impurities, act to cause excessive oxidation and sludging.

There are three chief sources of foreign impurities: (1) from the air taken through the carburetor and the crankcase ventilating system; (2) from the combustion of the fuel charge and generally a small portion of the lubricating oil; and (3) from the interior of the engine itself.

Atmospheric air is never clean. Impurities which contribute to atmospheric pollution include carbon from the combustion of fuel; particles of earth; sand; ash; animal excretion; stone; wood; rust; paper; threads of cotton, wool, and silk; bits of animal and vegetable matter; and pollen.

A microscopic examination of the impurities in city air shows that a large percentage of the particles are carbon. Atmospheric impurities are generally classified according to the size of the particles, as dusts, fumes, and smoke.

Dusts are particles of solid matter varying from 1.0 to 150 microns in size.

Fumes include particles resulting from chemical processing combustion, explosion, and distillation, ranging from 0.10 to 1.0 micron in size.

Smoke is composed of fine soot or carbon particles, less than 0.10 micron in size, which result from incomplete combustion of carbonaceous materials such as coal, oil, tar, and tobacco. In addition to carbon and soot, smoke contains unconsumed hydrocarbon gases, sulphur dioxide, sulphuric acid, carbon monoxide, and other industrial gases capable of reacting with the unsaturated hydrocarbons of oils.

Obviously the character of air impurities varies widely with the locality; however, the following are

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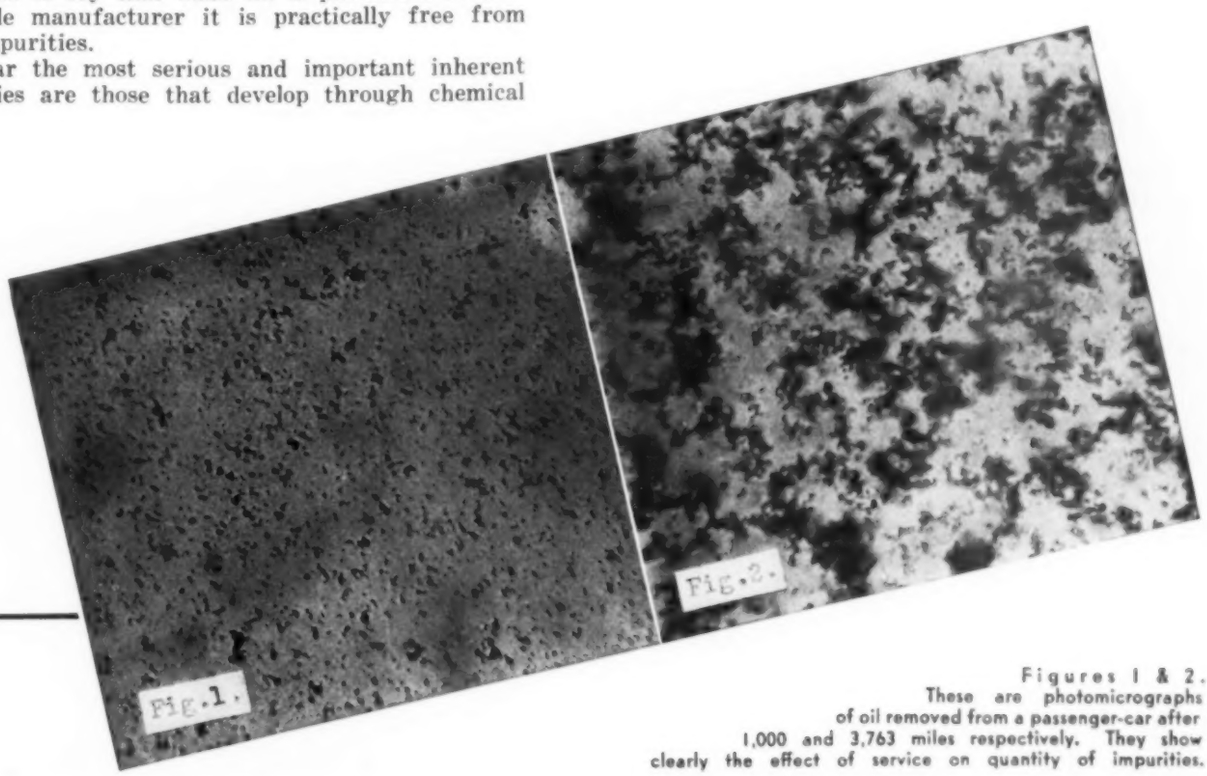
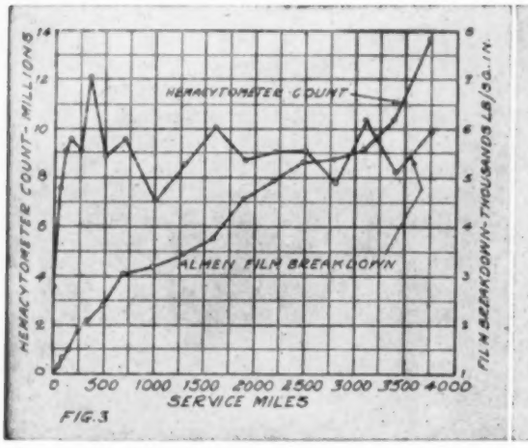


Figures 1 & 2. These are photomicrographs of oil removed from a passenger-car after 1,000 and 3,763 miles respectively. They show clearly the effect of service on quantity of impurities.


HEMACYTOMETER COUNT - MILLIONS
FILM BREAKDOWN - THOUSANDS LB/SQ. IN.
HEMACYTOMETER COUNT
ALMEN FILM BREAKDOWN
0 500 1000 1500 2000 2500 3000 3500 4000
SERVICE MILES
FIG. 3

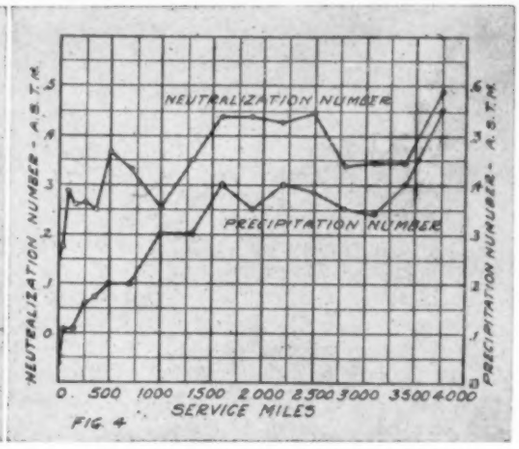


FIG. 4

approximate averages of atmospheric dust concentrations: Rural and suburban districts—0.2 to 0.4 grains per 1,000 cu. ft.; metropolitan districts—0.4 to 0.8 grains per 1,000 cu. ft.; industrial districts—0.8 to 1.5 grains per 1,000 cu. ft.

On an average, approximately 1,000 cu. ft. of air are required for combustion purposes alone per gallon of gasoline. To this must be added the quantity of air used for crankcase ventilating purposes.

Thus it will be appreciated that in the course of the life of a motor vehicle a considerable quantity of atmospheric impurities enters an engine, notwithstanding the fact that all present-day engines are universally equipped with efficient air cleaners; at least, they are efficient when new and when properly cleaned in service.

Combustion impurities consist of carbon particles, sulphur, and its compounds, gum, water, carbon dioxide, and unburned fuel. Most of these, of course, are ejected from the engine through the exhaust, but some, regardless of the mechanical condition of the engine, escape or work their way past the pistons and rings, into the crankcase oil, thereby contaminating it. The extent to which this class of impurities contaminates the oil depends mainly on the mechanical condition of the engine, especially on the effectiveness of the rings to prevent blow-by, the condition of the ignition system, the characteristics of the fuel, and other factors.

It is common knowledge that a considerable portion of the unburnt fuel works its way past the rings and enters the crankcase, creating what is commonly termed dilution. Not many years ago, dilution was frequently given as one of the major reasons for crankcase draining. Since the introduction of the crankcase ventilator and thermostatic control of the cooling water, we have been hearing less and less about crankcase dilution.

It is questionable whether or not dilution has merited the extensive attention that it has received in the past. It is now generally believed that it is not, except in a few cases where operating conditions are unusual, necessary to drain the crankcase because of excessive dilution. It has been said that dilution permits rapid wear. There does not appear to be sufficient test data to substantiate this conclusion, but on the contrary, recent test results indicate that no appreciable increase in wear is discernible even with extremely highly diluted oils.

Since it is generally believed now that too heavy oils have been used in the past, in all probability dilution has in the past done more good than harm, by reducing the viscosity of the oil, thereby insuring quicker distribution to the various surfaces requiring lubrication.

In this section of the country (Baltimore, Md.) it is questionable whether it is ever necessary to change oil because of excessive dilution. In the northern sections of the country if a vehicle is used during extremely cold weather for only short trips when frequent starts and stops are made and the choke is used freely, and, especially if the motor is in poor mechanical condition, one may be justified in changing oil because of excessive dilution. It should be remembered, however, that the S. A. E. recommends 10-W oil plus 15 per cent kerosene for temperatures lower than 15° F. below zero.

It is a known fact that diluent is present in a varying degree in all crankcase oils, and that the percentage present varies with the type of engine, its mechanical condition, its manner of operation and especially with atmospheric conditions. Dilution, by its very nature and volatility, reaches an equilibrium wherein the rate of its evaporation and that of formation are equal. Equilibrium is generally established after only a few hundred of miles of operation and frequently in less than one hundred. In the more

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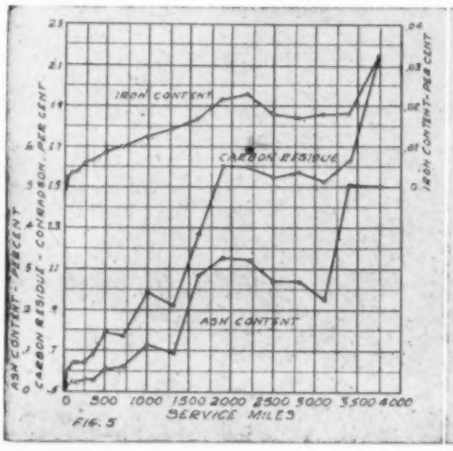
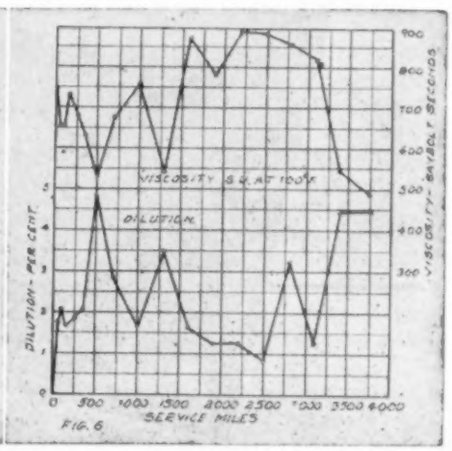

ASH CONTENT - PER CENT
CARBON RESIDUE - CONRADSON - PER CENT
IRON CONTENT - PER CENT
IRON CONTENT
CARBON RESIDUE
ASH CONTENT
0 500 1000 1500 2000 2500 3000 3500 4000
SERVICE MILES
FIG. 5


DILUTION - PER CENT
VISCOSITY - SAYBOLT SECONDS
VISCOSITY S.A.E. AT 100°F
DILUTION
0 500 1000 1500 2000 2500 3000 3500 4000
SERVICE MILES
FIG. 6

Controlled Power

Makes the FWD A Safe, Sure-Footed Truck on All Roads!

The best *"showroom"* for the FWD Truck is the great outdoors. There—in mud, sand, loose soils, snow, and on slippery or icy pavements—its *Controlled Power* has won a large and loyal following . . . The famous Four-Wheel-Drive principle — that of equalized power and load distribution — gives the FWD Truck sure, positive traction. It's a safer truck and one that's sure to "get through," regardless of how strenuous the tasks before it may be . . . In FWD construction, a center differential distributes power equally to all *four* driving wheels—and this power is always headed in the same direction in which the driver is steering. It is not operating at cross purposes . . . Test your trucks by their road performance. Put the FWD in the hardest service you have. You'll find it is more reliable—safer—and more economical. *Write us for more specific information pertaining to your own hauling problems.*

FWD Controlled Power Means...

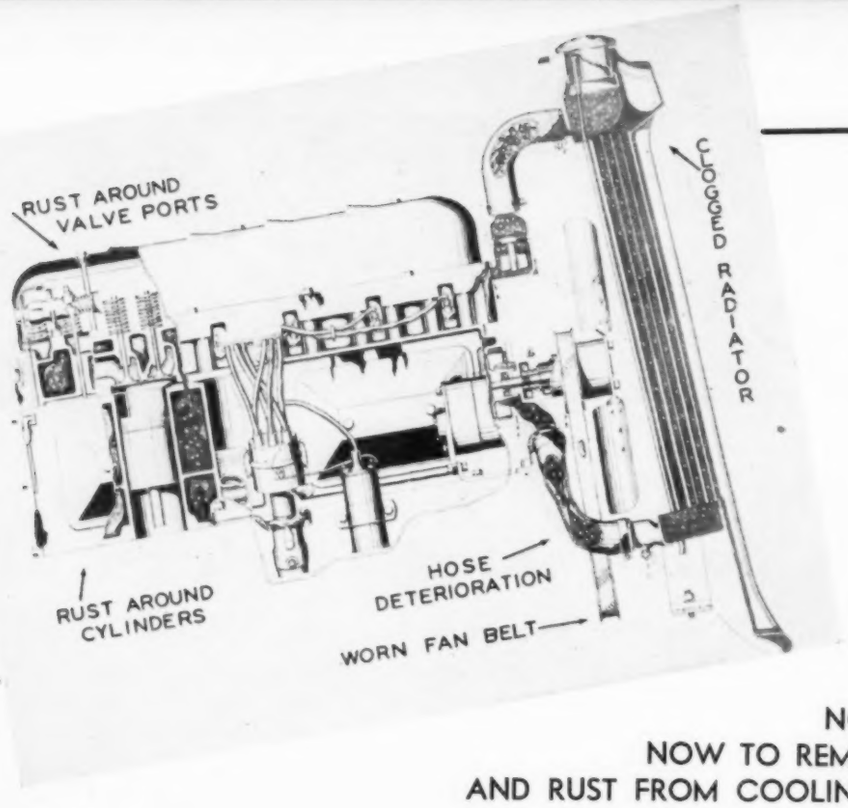
- Greater Safety
- Faster Service
- Greater Dependability
- Wider Range of Operation
- Operating Economy

FWD

THE FOUR WHEEL DRIVE AUTO CO.
CLINTONVILLE, WISCONSIN
Canadian Factory, KITCHENER, ONTARIO

FOUR-WHEEL-DRIVE TRUCKS

THE SAFEST TRUCK ON THE HIGHWAY



NO TIME LIKE
NOW TO REMOVE SCALE
AND RUST FROM COOLING SYSTEMS

CORROSION-INHIBITORS Cut Fleet Costs

By D. L. Dungan

A RECENT survey conducted by this publication revealed the fact that there perhaps lies a huge, hidden menace, eating away at cost-sheets and profits in many fleet operations, in the form of cooling system rust, scale and corrosion. . . . "An old story," you might be inclined to conclude, upon reading this opening paragraph, but listen to this: The question which brought this information to light was, *"Are your drivers permitted to pick up radiator water anywhere they happen to be?"* The answers (out of 100 replies) were "Yes"—84; "No"—7; "In emergencies only"—4; "No answer"—5. . . . Think of it, 84 per cent of the participating fleet operators, located in 34 states, permit their drivers to use *any* kind of water at all, in their expensive rolling stock, just so long as it's water.

Let us delve into the thing a bit further. Statistics show that ordinary hard water contains from 10 to 65 grains of hardness per gallon, varying, of course, with the locality in which the water is obtained. Most of this "hardness" consists of magnesium and calcium, or salts thereof. When such water is heated (and sometimes boiled) as it is in truck and bus cooling systems, these "foreign" materials form scale on the wall surfaces of radiator tanks, passages and water-jackets—just the same as they form scale in your steam boiler or tea kettle.

In engines, this scale forms an insulating wall that prevents dissipation of heat from cylinder to cooling water, in addition to clogging the radiator cores, which we all know about. Both of these ills cause motors to overheat, especially in the summer months, and to operate at dangerously high temperatures. Then, too, if the cooling water is not specially treated, rust will rapidly form in the cooling system, adding further "fuel to the fire."

The worst feature of this rust and scale formation is that many fleet operators do not realize that this condition saps profits by increasing operating costs. An increase in oil and fuel consumption might occur in warmer weather and often is taken for granted; engine repairs are sometimes passed off lightly as a matter of general overhead; and the *cause* very often is likely to be neglected—in this case, one that could easily be remedied.

To those of you who might think that the preceding paragraph is a bit far-fetched, let us offer a few basic fundamentals. The ill effects of rust and scale in cooling systems, on general motor efficiency is quite apparent. Excessive heat from the combustion within the cylinder is supposed to escape through the cylinder walls and be carried away by the water in the jackets.

When rust and scale form in the water-jackets, this heat cannot escape as rapidly as it should—in fact, not as rapidly as the designing engineers intended it should. The insulating "blanket" which rust and scale forms, therefore, tends to keep the heat in the cylinder and results in local overheating of such parts as pistons, valves, bearings and other working parts. Inefficient combustion and higher temperatures of

(*Please turn to page* 64)

No. 1 in economy

THRIFTY MODELS TO MEET EVERY TRANSPORT NEED

MACK Look at the operating costs as well as the price tag! That's how to get really inexpensive trucks! Mack holds a 37-year-old record for utmost dependability, slowest depreciation, minimum maintenance. Experienced buyers know that these are the essential ingredients of true trucking economy!

•

MACK JR Operators of lighter trucks hailed the introduction of the Mack Jr in 1936. The Mack Jr offers reserve strength and staying power never before achieved in the low-price field. Before you buy any truck at any price, see the complete Mack line!

MACK TRUCKS, INC., NEW YORK, N. Y.

America's No. 1 Line of Trucks

OVERDRIVE

FOR MOTOR TRUCKS

What good is Overdrive? Is it useful in a dump truck? A truck proceeding up a grade? A truck in city traffic? A logging truck? A coal delivery truck? In *any* truck?

At first glance "No!" But those who use it in heavy duty service emphatically say "*Yes!*" Let's find the reason.

There are several kinds of Overdrive. Overdrives in passenger cars and overdrive gears in truck transmissions reduce engine speed at high road speed. These Overdrives are just *one* gear, with *one* use. They are used for speed. They are not useful for pulling.

But Overdrive in an auxiliary transmission mounted behind a truck transmission is *not* one gear. It is *four* gears! It is a *different* Overdrive! It is used for *pulling*! It has *many* uses!

23% FEWER R.P.M.'S

Watson-Brown-Lipe gives an overdrive to *each* transmission gear—to first, second, third and high. It reduces engine speed at high road speed and produces three transmission power gears — *pulling* gears.

What value lies in that? Time saving. Performance. Miles per hour profit. How so? Consider. If on slight grades or traffic a truck cannot use high, it must drop back to third. Third may be too slow, may race the engine. But drop to Overdrive third, which is lower than high and higher than third. Is that a benefit? Here is the answer: in High, its speed is 46 miles per hour; in Overdrive 3rd, 35 miles per hour; in Third, 27 miles per hour.

Overdrive third is 8 miles per hour faster than third. Overdrive second, 5 miles faster than second. Overdrive first, three miles faster than first. And *these* overdrives *pull*. They save time! Time is money!

These overdrive gears do not lug the engine because they are *lower* than high. If an engine will pull *at all* in high, it will pull in these three gears. Engine power has nothing to do with it!

So those are wrong who say: "Fast enough now. Don't need Overdrive. Engine hasn't enough power for Overdrive. Overdrive lugs engines." This thought comes from associating Overdrive only with speed. But Watson-Brown-Lipe Overdrive produces *three* gears for power plus *one* primarily for speed; the Overdrive high. This gear slows the engine or it speeds the truck.

These figures show the benefit of Overdrive high: All figures typical.

Engine RPM in High	*Truck Speed*	*Engine RPM Overdrive High*
2420 rpm	35 mph	1860 rpm
2760 rpm	40 mph	2120 rpm
3110 rpm	45 mph	2390 rpm

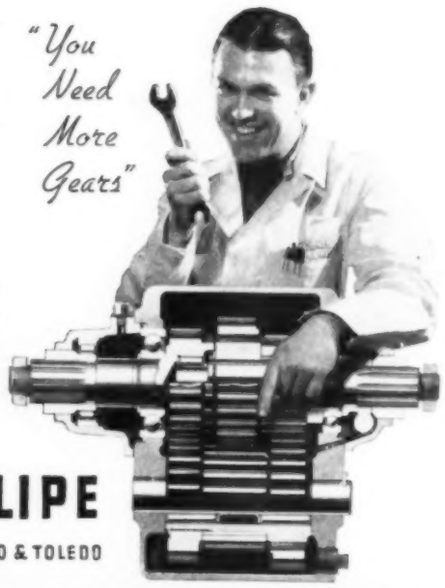
At 45 miles per hour, Overdrive high reduces engine speed from 3110 to 2390 and saves 43,700 revs. per hour. Or, instead of going 35 miles per hour at 2420, go 45 at 2390. Overdrive high saves fuel, saves engine wear, when light loaded or returning empty.

20% LESS FUEL

Boiled down, this is the value of Watson-Brown-Lipe Overdrive for motor trucks! It has power for pulling. It is a time saver. It is a performance creator. It is a profit maker. Be guided by an understanding of it and proceed to profit with it.

* * * *

Watson-Brown-Lipe Auxiliary Transmissions combine Overdrive *with* Underdrive — producing 12 speeds forward and 3 reverse — a maximum of *usefulness*.



AUXILIARY *Transmissions* **WATSON-BROWN-LIPE**

H.S. WATSON CO., SAN FRANCISCO & TOLEDO

• NEWS of the TRUCK INDUSTRY •

F. W. D. Increases Capitalization; Sales Good

UNANIMOUS support of a resolution to increase the capitalization of the Four Wheel Drive Auto Company from two million to three million dollars was voted by the stockholders last month. . . . Sales of the Company for the first 10 months of the present fiscal year have amounted to more than $1,000,000 more than the sales for a similar period in 1935-1936, or an increase of 40.2 per cent, according to Walter A. Olen, president.

•

Larger Wheelbase for UA-UB Autocars

AS originally announced on page 40 of our June issue, the new cab-forward Autocars (Models UA and UB) were made available with three wheelbases—84, 106 and 124 inches. . . . Now Autocar announces that another wheelbase, 142 inches, is also offered, suitable for a 16-foot body. . . . The Company also announces the availability for these two models of a 6-man cab, such as is used in public-utility construction work. . . . Details may be obtained from The Autocar Company, Ardmore, Pa. . . . Mention of FLEET OWNER always helps.

•

Reo Sales Shatter Many Records

ALL records for Reo truck and bus shipments for the past eight years were shattered in May, shipments for the month exceeding those of any previous month since May, 1929. . . . They also exceeded by wide margins Reo's combined totals of passenger-cars and trucks for all but a few scattered months during that period, including one stretch of 42 consecutive months.

•

Diamond-T Signs Pact With Employees

DIAMOND-T, which is now in sixth place among truck manufacturers, has signed an agreement covering wages, hours and working conditions with the Automotive Workers Industrial Union, which includes 99 per cent of its employees, according to C. A. Tilt, president of the Company. . . . The union had been formed voluntarily, several months earlier, and has no affiliation with any other organization, labor or otherwise.

White Appoints Dunbar Purchasing Agent

JOHN E. DUNBAR has recently been appointed purchasing agent for The White Motor Company. He brings to the Company much valuable knowledge gained from 18 years' experience in the materials end of the motor industry, having recently been assistant general manager of the Aviation Manufacturing Corporation of Williamsport, Pa.

•

Lathan in New, Modern Factory

HERE is the new, modern home of Lathan Co., Inc., South San Francisco, Cal., power-brake manufacturers. The entire plant is devoted to the manufacture of Lathan Power-Brakes, for which purpose it is said

to be the last word in modern design and equipment. . . . According to A. S. Lathan, president, the company has simultaneously expanded its line and stepped up its general activity, making this one of the most complete power-brake lines in America.

•

Moyers Heads "Diesel Motors, Inc."

G. L. MOYERS, for nine years director of sales of Handy Governor Corporation, has resigned recently, to become president and general manager of Diesel Motors, Inc., a corporation formed to distribute and service Diesel-engined equipment in Detroit and Michigan. . . . Headquarters are at 3740 Cass Avenue, Detroit. . . . The corporation has also acquired Michigan distributing rights to Clydesdale Diesel-powered trucks, as well as a franchise for Buda Diesels and Witte industrial Diesels and generator plants. . . . Complete sales and service facilities are now available.

New IHC Truck Plant in Indianapolis

CONSTRUCTION of a large manufacturing plant for the building of engines for the entire International line of motor trucks was announced recently by S. G. McAllister, president of International Harvester Company. . . . The new plant, including buildings, equipment and machinery, will cost more than $4,000,000 and will occupy a 75-acre tract in southeast Indianapolis. . . . When completed, it will have an initial manufacturing capacity of 700 truck engines per day and will employ over 3,000 men. . . . The new Indianapolis plant is the longest step in factory expansion taken by the Harvester Company in many years and constitutes one of the largest additions to Indianapolis industry since the World War. . . . In 1936 the registration of new International trucks in the United States was 34.6 per cent ahead of 1935, which previously had been the best year in the Company's truck business.

•

Thornton Fleet Sales Company Formed

ESTABLISHMENT of the Fitzpatrick-Thornton-Tandem Fleet Sales Company is announced, with headquarters at 780 Eleventh Avenue, New York, N. Y. . . . Mr. Fitzpatrick has, for the past four years, been handling national account sales for the F. W. D. Auto Company. . . . The new company will now handle sales and service of Thornton-Tandem Four-Rear-Wheel Drive Units, designed for use on Ford, Chevrolet and other light trucks, to national accounts exclusively, covering the entire Eastern territory.

•

Reo Appoints Flogaus as Coach Engineer

APPOINTMENT of Howard A. Flogaus as coach engineer of the Reo Motor Car Company was announced recently by D. E. Bates, president and general manager. . . . Mr. Flogaus has been coach engineer for the Yellow Truck & Coach Manufacturing Company for the past seven years. He was previously engaged in passenger-car sales and engineering work.

•

Plans for Fourth Annual Truch Show

PLANS for the 1937 Annual National Motor Truck Show, to be held in Newark, N. J., this Fall, are well under way. . . . Requests for space are 100% ahead of last year, according to A. L. Rice, Secretary of the New Jersey Motor Truck Association, one of the sponsors of the coming show.

•

Harris Joins MacMillan Petroleum

SID G. HARRIS has recently joined the staff of MacMillan Petroleum Corporation, makers of MacMillan "Ring-Free" Motor Oil. . . . He is located at their New York City offices, 50 West 50th Street. . . . Mr. Harris is well known among fleet operators, having been Chairman of the "Met" Section, S.A.E. during 1934-1935. . . . He was formerly sales engineer for Continental Motors and more recently was with the Reo Motor Car Company at New York.

What Does "Over-Drive" Offer Truck Operators?

•

"OVER-DRIVE" does not mean speed alone. . . . When used in auxiliary transmissions it provides faster lower-gears and bridges the gaps between conventional speeds in standard transmissions. . . . The author attempts to straighten you out in this regard.—H. C. F.

By Frank M. House

NOW that passenger-car over-drives are receiving so much attention from the public, many truck operators of an inquiring turn of mind are asking whether over-drive offers anything of value in truck operation. Unfortunately, the answer is usually pre-conceived. The word "over-drive" betokens speed, and the natural impulse is to associate it with speed. Why not, since the word itself suggests the idea of speed? The truck operator knows that he can already exceed legal or safe speeds even with a heavy load, so he turns a cold shoulder to the thought of any more speed.

Having driven a passenger-car equipped with over-drive, he realizes that while it reduces engine speed, it reduces pulling power too, and, knowing what "lugging" an engine will do to it, he concludes that over-drive hasn't much to offer. Perhaps he already has a truck with, say, a five-speed transmission, d i r e c t-on-fourth with over-drive on fifth. He has observed that this has much the same characteristics and is used for about the same purpose as a passenger-car over-drive, and this strengthens his conclusion that over-drive isn't much, if any use in truck operation. Or, having that over-drive gear in his truck transmission, he may say, "I have over-drive already", thinking that he is already fully equipped with all that over-drive has to give.

These usual misconceptions are quite natural. This is unfortunate, because certain kinds of over-drive really offer a marked advantage to the heavy-duty truck operator. So, let's look into this question of over-drive.

YOU would not think that over-drive would do much good in this type of operation. . . . The "over-drive" provided by auxiliary transmissions, the author points out, is really no over-drive at all in this case, but an assortment of speeds that is conducive to flexibility in power.—Editor.

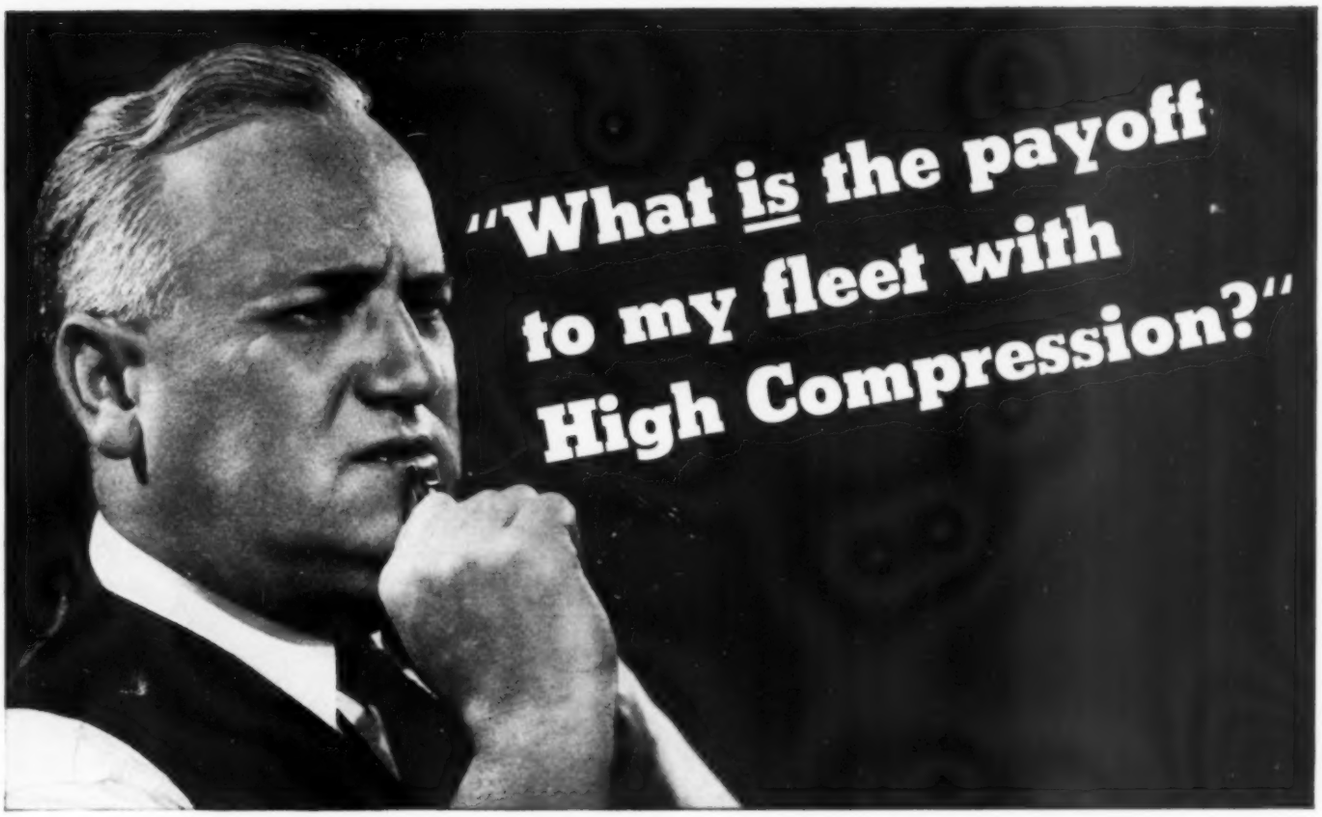
Roughly speaking, there are three different kinds of over-drive: the passenger-car types, the truck-transmission type, and the auxiliary-transmission type. The over-drives in passenger-cars and in truck transmissions are characteristically alike. They are one gear; a gear of higher ratio than high or direct, and their principal, if not only, use, is to cut down engine revolutions while the vehicle maintains a high road speed. Being a higher ratio than direct gear they have less pulling power than direct, hence they are not particularly useful when any pulling is involved. Their principal use is connected with speed.

The third type of over-drive, which is that produced by the over-drive gears in an auxiliary transmission mounted behind the truck transmission, has an entirely different mechanical action. Instead of being only one gear, it is, in effect, four different gears. It transmits a higher ratio, or over-drive, to each of the four forward truck transmission gears. Accordingly, we have an over-drive first, over-drive second, over-drive third, and an over-drive high. The first three of these, over-drive first, second, and third are all of lower ratio than direct or high, hence they rank better in pulling power than high gear. We can forget that they are labeled "over-drive" gears and consider them for what they really are—that is, three pulling gears, used just like any other gear in the transmission.

Their principal value lies in the fact that they *split* the spaces or steps between the regular first and second, second and third, and third and high gears in the truck transmission. To say it another way, they give us gears between high and third, third and second, and second and low.

The advantage of this is quite obvious and will be readily apparent to the trucker who operates on a route fairly sprinkled with grades. Suppose

(*Please turn to page* 64)



There's a double payoff . . .

1. *Faster Schedules* 2. *Bigger Payloads*

YOU get more power out of each gallon of gasoline you burn in your fleet when you have high compression engines in your trucks or buses. You can turn this *extra* power into *extra* profit by using it to maintain better or faster schedules or by using it to pull a heavier payload.

To get this extra power—extra profit, you should know these four facts:

1. High Compression has helped to increase horsepower per cubic inch 76.5% and maximum brake horsepower 56% in the average truck or bus engine in the last 10 years.

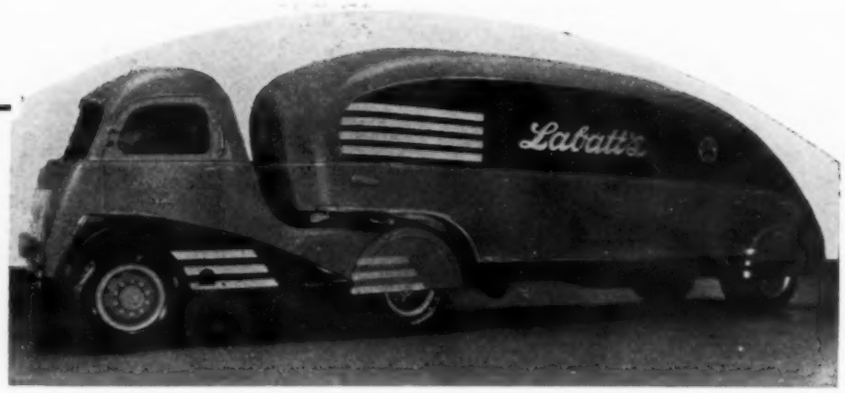
2. Since 1934, nearly all new truck and bus models have been designed with high compression engines and are expected to use regular-grade gasoline (containing tetraethyl lead) of high anti-knock value to get maximum performance.

3. Earlier models can be high compressioned when they are overhauled by installing high compression pistons or heads.

4. All high compression engines burning gasoline give their maximum performance on gasoline of high anti-knock value, with the spark set to match the quality of the fuel, according to manufacturer's specifications.

If you have further questions on fuels and their part in increasing the efficiency and performance of *your* trucks or buses, write Department B. Ethyl Gasoline Corporation, Chrysler Building, New York, N. Y., manufacturer of anti-knock fluids for premium and regular gasolines.

NO ENGINE IS BETTER THAN ITS FUEL



"Streamlines" Save Fuel *in* Tractor-Trailer Test

•

SCHEDULES are also speeded-up with the use of streamlined equipment, Canadian Brewery finds, in fair test made with both types of units. . . . The advertising value of modern design needs no further expounding. . . . Labatt's now standardizes on streamlines.—Editor.

TRIED and tested during a twelve-month period, and displaying many practical advantages over their own conventional-type units in increased efficiency plus lower operating costs, trucks of revolutionary streamlined design last month were placed permanently on the standard equipment list of John Labatt Limited, brewers of London, Ontario, Canada, which firm a year ago purchased from The White Motor Company four all-streamlined trucks, claimed to be the first ever built.

Evidence of Labatt's intention to standardize on streamlined style is found in the fact that they recently ordered four cab-over-engine White Model 812 tractors, specifying that they were to be built radically different from any other truck, and giving Count Alexis de Sakhnoffsky, White's exclusive stylist, free rein in his work.

One of the finished units is now on display at the Great Lakes Exposition in Cleveland, where fleet owners consider its style to be at least five years ahead of the conventional design field, according to White officials. A photograph of this first unit appears at the head of this article.

Further evidence of the move to standardize on streamlined design comes from energetic Hugh Mackenzie, comptroller and sales manager for Labatt's, who recently made a trip to the White factory and to the Exposition to see the latest Sakhnoffsky-designed unit. Enthusiastic over the performance of the first smartly-styled trucks of a year ago, and tremendously pleased with the new units, he had this to say regarding Labatt's attitude toward streamlined design:

"When we first entertained the idea of streamlined design, well-wishers told us that it would cost too much: that it was a luxury and without practical value. We went ahead, asked White to build us such a truck and, contrary to all available advice, discovered that streamlining brought increased efficiency, lower-operating costs and added prestige to the Labatt name."

As proof of the practical values and advantages found in streamlined units, Mr. Mackenzie relates the details of a test staged by Labatt's, soon after the purchase of their first all-streamlined truck.

Two White tractors and semi-trailers, one streamlined and the other of conventional design but both of the same model and carrying like loads, started out together on the 125-mile run from Toronto to London, Ontario, Canada, headed into a 15-mile an hour westerly wind. The streamlined White arrived in London using 9% less gasoline, making the trip approximately 10 miles per hour faster than its conventional mate, also of the same manufacture.

"It took courage and foresight to order the first all-streamlined trucks ever built, but we wanted something different and we got it", he declared. "But now, commonsense tells us that when streamlined design gives increased efficiency and lower-cost operation, plus added prestige to the Labatt name, the idea is no longer a luxury. Radical streamlined style in our trucks is now a vital cog in our transportation system. It's standard with Labatt's!"

Declared by its makers to be the most beautiful truck ever placed on the highways, the latest Labatt cab-over-engine White was painted a brilliant Labatt red at the company's shops, has a deluxe finish,

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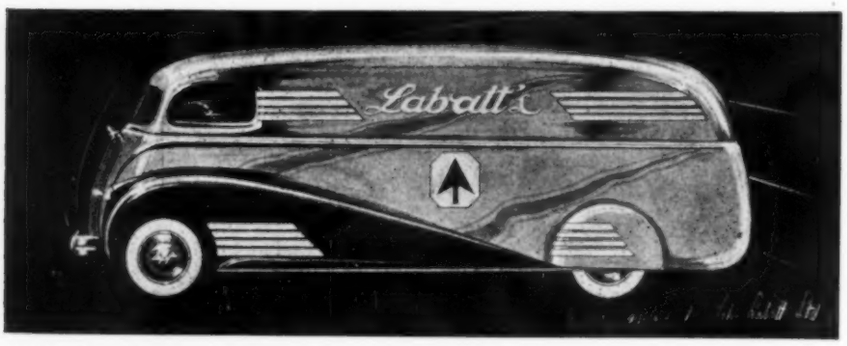
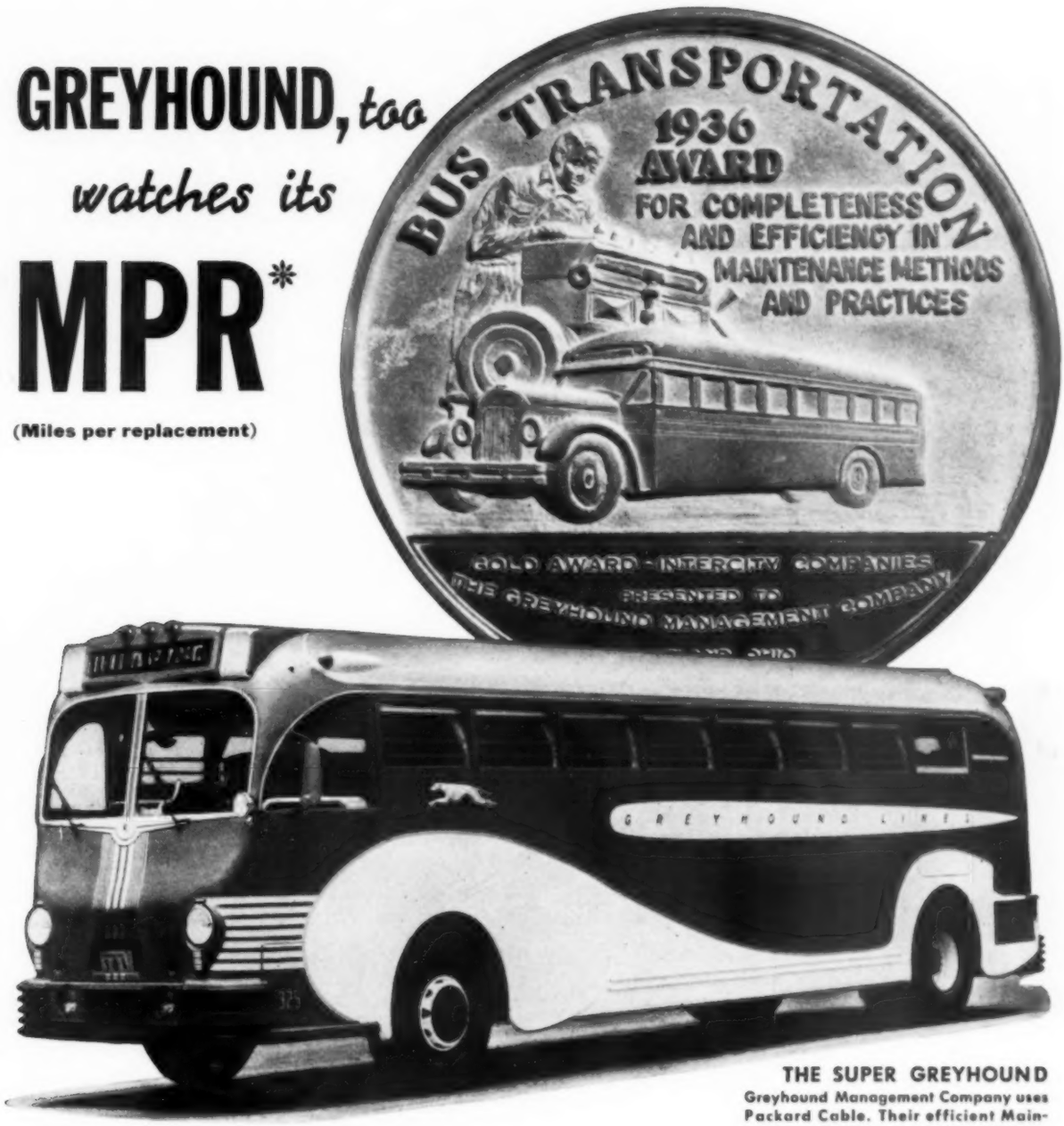


THIS rolling billboard was the forerunner of streamlined design in Labatt's equipment. Because Canadian laws prohibit beer and liquor advertising in newspapers and magazines, this brewery demands trucks of attractive design. Then state that they no longer consider streamlines as a "luxury" item.

GREYHOUND, *too watches its*

MPR*

(Miles per replacement)



THE SUPER GREYHOUND
Greyhound Management Company uses Packard Cable. Their efficient Maintenance Division was the 1936 Bus Transportation Gold Award Winner.

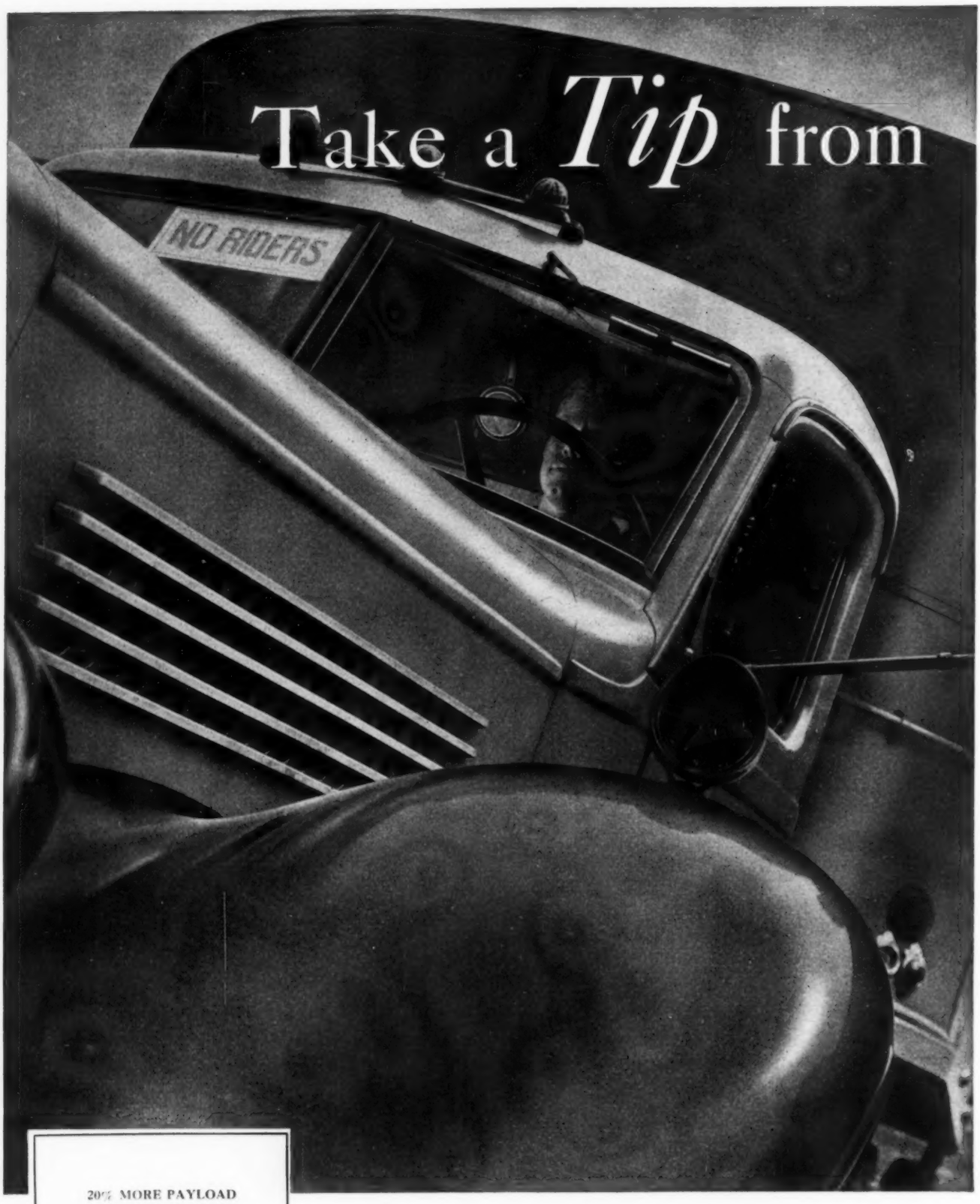
The excellent results achieved by Packard FOUR-FORTY Ignition Cable cut down maintenance costs—give more miles per replacement. For the secret-formula, inorganic-base compound that sheaths Packard FOUR-FORTY offers unusual resistance to heat, cold, oil, age, moisture and corona—the mortal *enemies* of ignition cable. Start now to save money. Eliminate *one* cable replacement *out of every three.* Install Packard FOUR-FORTY on your equipment. Call your jobber or jobber salesman today. Packard Electric Division, General Motors Corporation, Warren, Ohio.

* AND *MORE* MPR MEANS *MORE* PROFITABLE RESULTS!

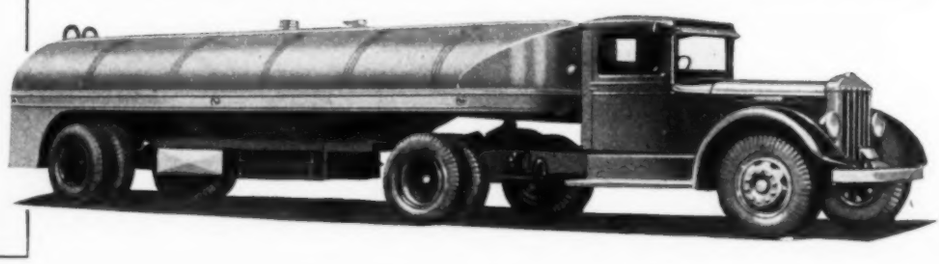
Packard
REG. U.S. PAT. OFF.
TRADE MARK

THE STANDARD WIRING EQUIPMENT OF THE AUTOMOTIVE INDUSTRY

Take a *Tip* from



20% MORE PAYLOAD — NO INCREASE IN WEIGHT. ***USS* COR-TEN** *on this semi-trailer tank truck cut off hundreds of pounds of dead weight, increased capacity 250 gal., increased profits an estimated $100 a month.*



your Windshield Sticker...

Don't lug around

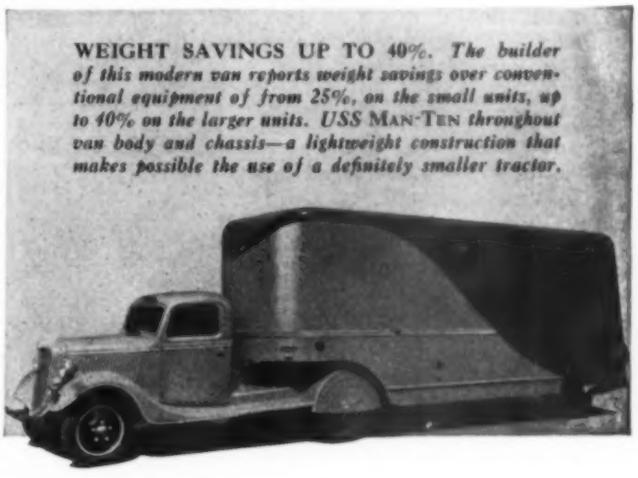
Dead Weight

EXCESS weight has no business on the trucks you operate. It increases motor loads, burns up gasoline, wears out brakes and tires, increases operating costs. Needless weight reduces payload capacity. Get rid of it.

You can maintain strength and safety and substitute construction weighing 20% to 40% less at a nominal cost and with little change in shop methods, by using USS COR-TEN and USS MAN-TEN. COR-TEN's 35% greater resistance to abrasion and its added resistance to atmospheric corrosion, amounting to four to six times that of plain steel, are some of the properties which support these facts.

While other steels have advanced in price, COR-TEN has remained unchanged. Now, at little or no increase in cost, you can obtain all of the profitable advantages in strong and durable equipment of light weight by using this superior steel.

For information as to what can be accomplished through the use of USS COR-TEN and other USS High Tensile steels, write us. Our engineers welcome inquiries.

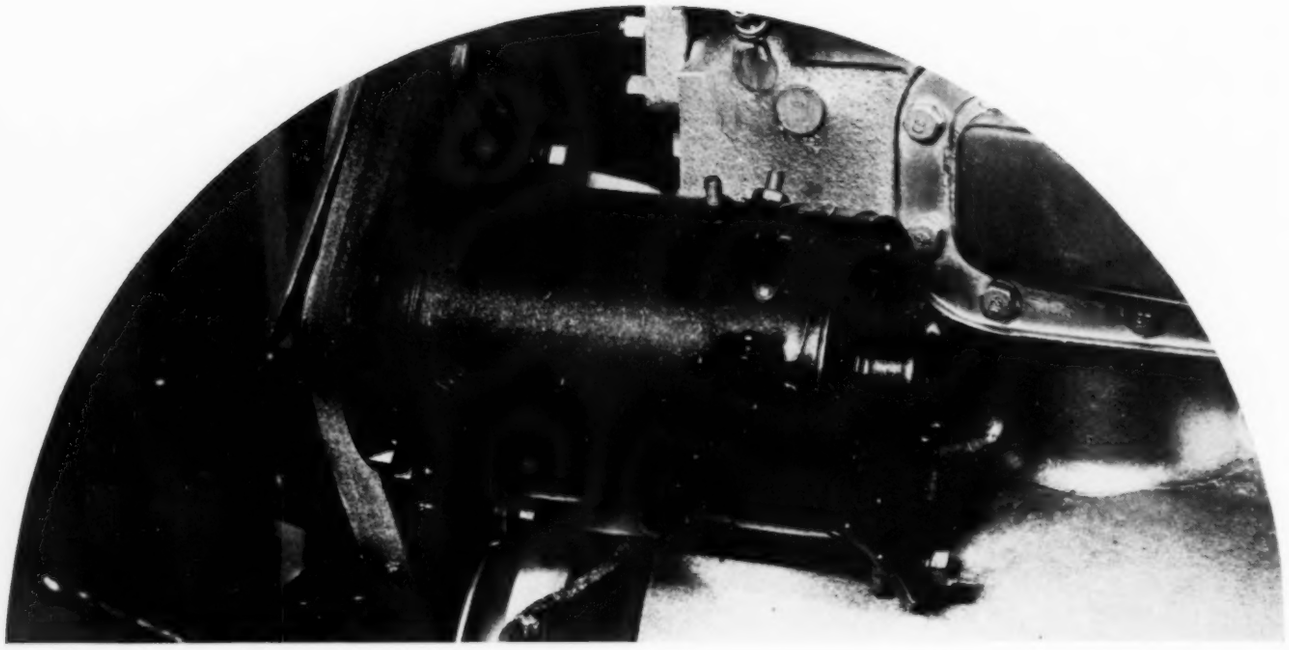


WEIGHT SAVINGS UP TO 40%. *The builder of this modern van reports weight savings over conventional equipment of from 25% on the small units, up to 40% on the larger units. USS* MAN-TEN *throughout van body and chassis—a lightweight construction that makes possible the use of a definitely smaller tractor.*

U·S·S HIGH TENSILE STEELS

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago, and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL



Give Your Generators a Break!

THE demand for electrical equipment has grown to such a tremendous extent that a big or special generator is required to meet the needs of the modern car, truck or bus.

Thomas H. Stambaugh, general service manager of the Hudson Motor Car Company, recently computed that if all the electrical equipment on one of the big Custom Hudson Eight's happened to be turned on at the same time, it would be equivalent to an amperage draw of 95.29 amperes, or expressed in watts, would be the equivalent of a 571.74-watt lighting plant. So, you can imagine what a load there would be on the battery of a modern truck or bus, with the many lights and electrical devices that are used today.

"It is no wonder we have had to put larger and and larger generators capable of producing more and more current on cars," states Stambaugh. "Not very long ago a generator which would charge at the rate of 10 amperes was considered satisfactory. Today many generators have a normal output of 16 to 24 amperes, and for the winter they are often adjusted for an even higher output than that.

"If we drive a vehicle with the two headlights turned on, with the radio going and, naturally the tail light lit, we are using about 18 amperes. At this rate, the output from the generator just about balances with the current draw. Every time we blow the horn, however, we take 27 amperes, if we happen to have the twin air horns with which many cars, trucks and buses are equipped. Using the radio sometimes takes as much as 7.6 amperes. When we put on the brakes, the two stoplights light up at a cost of 6 amperes. When we use the cigar-lighter we draw 13 additional amperes, and so on down the line.

TYPICAL ELECTRICAL ACCESSORY LOADS

Two Headlamps	8.00 Amperes
Two Tail Lamps	1.00 "
Cigar Lighter	13.00 "
Radio	7.60 "
Heater-Deluxe	2.75 "
Dome Light (15 cp.)	2.50 "
Ignition	1.50 "
Defroster (heater type)	9.80 "
Horns (twin air)	27.00 "
Amber Fog Light	6.15 "
Warning Signal (wig wag)	1.39 "
Glove Box Service Lamp	.20 "
Two Stop Lights	6.00 "
Headlamp Tell-Tale	.20 "
Electric Clock	.40 "
Instrument Lamp	.40 "
Spot Light	6.60 "
Tell-Tale Lights (ammeter and oil pressure)	.40 "
Gas Gauge	.20 "
Heat Gauge	.20 "
Total Load	95.29 Amperes

"The average operator does not realize the load on the electrical system of an up-to-date car, or a properly lighted truck. Of course we do more daylight driving, normally, than night driving. This gives the generator a chance to bring the battery back to normal after the severe drain due to headlights and other equipment used at night. Voltage regulation as used on many modern units prevents over-charge in the event the operator does not use all of this equipment.

"Driving during a winter night puts the greatest load on a battery. At that time, in addition to the equipment mentioned above, we may use a defroster which takes 9.8 amperes, or we may have one of the amber fog lights used at the front end of many vehicles. These usu-

(*Please turn to page* 68)

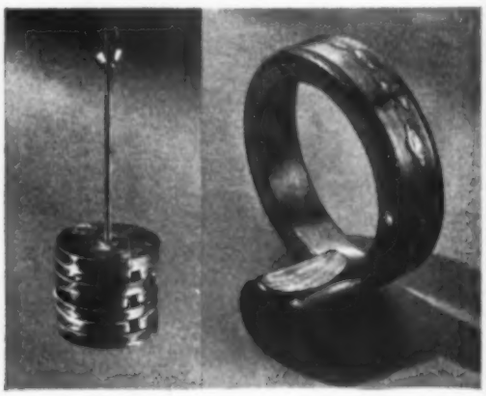
WHAT DO YOU MEAN *That Oil Stands Up?*

RING-FREE TEST NO. 1

One of a series of "make-your-own-tests" pioneered by Macmillan, requires the use of the laboratory film-strength testing machine pictured.

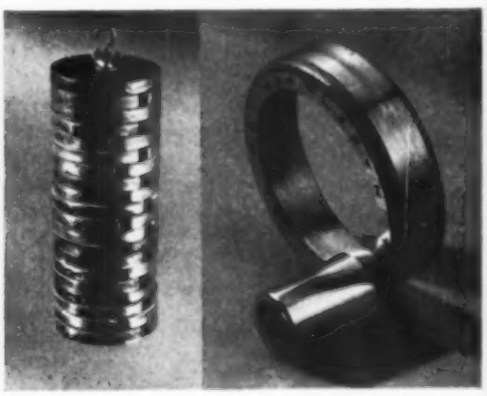
"Doesn't break down during every day use or even under extreme emergency conditions" is what most people mean when they say, "That Oil Stands up!" Generally speaking, the oil with the toughest film-strength "stands up" better than other oils. And here is a quick easy way to accurately measure the comparative film-strength of motor oils.

First, take a sample of your favorite motor oil . . . the oil you consider "the finest oil made," and test it on this machine. Parts of Timken Roller Bearings are used to provide uniform metal strength. Rotating in a bath of oil, one of these bearings, revolves against another, which is held in a stationary position to create a friction surface. Friction pressure is increased by adding weights to the lever arm. One pound weights added each minute increases the pressure at the ratio of 800 pounds per square inch. When this pressure becomes great enough to break the oil film, metal-to-metal contact occurs and rapid wear and metal seizure results. The average oil breaks down under only a few weights added with resultant wear pictured above.



Then, clean the testing machine thoroughly and repeat the test, this time using the same S.A.E. grade of Macmillan RING-FREE Motor Oil and new bearing parts. One weight each minute exactly as before. The result will surprise you.

Twenty weights or more will not break the film of RING-FREE because this motor oil is double-distilled to a purity of grade unmatched by other oils. Because RING-FREE lubricates better even under conditions of extreme pressure you will see by the results of this test that wear has been held to a minimum. You will also see that RING-FREE has an extra margin of film-strength more than sufficient to protect your motor even under abnormal conditions.



Here is the accurate answer to "How well any oil stands up". Here is the way to get direct comparative evidence of the film-strength of any motor oil. This remarkable machine also demonstrates, visually, RING-FREE Motor Oil's extremely high resistance to heat and its ability to cling to rapidly revolving parts so that a protective film of pressure-resisting oil is carried to the friction surfaces. The Macmillan Man in your area has this film-strength testing machine waiting for you to make these comparative tests for yourself. This machine will tell you more about motor oil film-strength than all the words in the world.

MACMILLAN PETROLEUM CORPORATION, 530 W. 6th St., Los Angeles
50 West 50th Street, New York City, and El Dorado, Arkansas

MACMILLAN
RING-FREE
MOTOR OIL

1. GREATER FILM STRENGTH
2. HIGHER HEAT RESISTANCE
3. LONGER CLING TO METAL
4. FASTER PENETRATION
5. REMOVES HARD CARBO
6. IS NOT CORROSIVE

10-Ton Refrigerator Makes Good Record

SIXTEEN hundred miles per week through Minnesota and Iowa is covered by a new 10-wheel, tandem-rear-axle International truck recently purchased by Geo. A. Hormel & Co. of Austin, Minn. The tandem

axle is reported to have proved advantageous in covering icy roads during the winter months.

The body, which was built by the R. H. Gray Body Co. of Austin, Minn., carries 10 tons of fresh meats and other packing-house products at a temperature of 40 degrees. Dry ice in open baskets is used for refrigeration. The body is equipped with Dry-Zero insulation. Temperatures along the route vary from 35 degrees below zero to 110 degrees above.

Aluminum is used for the outer body panels and for the channel floor sills. The framing is oak and the floor is oak over redwood sub-flooring. The walls and roof are lined with clear all-heart redwood.

The word "Hormel" on the front of the body is outlined with reflector buttons to make it visible at night. The name across the rear doors is similarly outlined with green buttons.

●

Census Report on Bus Operations

IN a recently published report, the United States Bureau of the Census gives data for the motor bus transportation industry, covering the year 1935. The report shows 1,751 concerns operating 19,182 buses, and paying $55,267,000 in wages and salaries to 39,613 employees.

Interstate operators comprised only 14 per cent of the total number, but they accounted for approximately one-half of the revenue and 40 per cent of the employees.

●

Wins Award; Holds Safety Banquet

CELEBRATING the winning of the Greater New York Safety Council accident-reduction contest, in their particular fleet classification, the New York Truck Renting Corporation (New York City) tendered an elaborate banquet to some several hundred drivers of their vehicles. The dinner and entertainment, now an annual event, was held at the Capitol Hotel in New York last month.

The principals of this up-and-coming truck-renting organization, Brothers Harold and Dave Fischler, were quite enthusiastic over their excellent safety record and we cannot blame them—they should feel quite proud. Conducting a safe operation in such traffic congestion as we have in New York City is a *real* accomplishment.

In addition to several prominent speakers who rendered brief, interesting talks on Safety, a feature of the dinner was the showing of Coca Cola's new sound picture, *"The Wheel of Chance"*. It was your Editor's privilege to attend this worthy gathering and we were particularly pleased to note the fine "family-like" attitude of the Company's drivers.

●

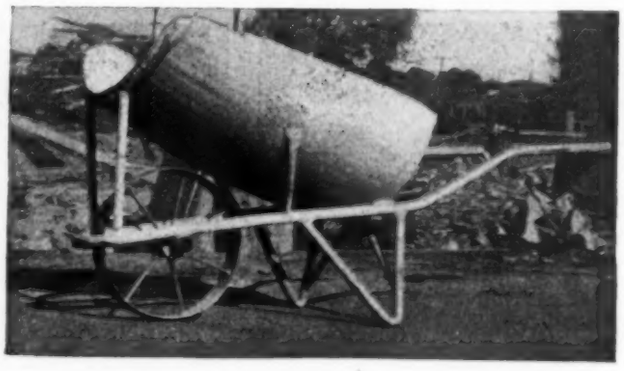
Gas Company Fabricates Own Wheelbarrows

THERE are wheelbarrows, and then there are wheelbarrows, according to the laborers working on construction for a West Coast gas company. In short, they have a very decided preference for the type of wheelbarrow fabricated out of scrap materials by the welding operators on the job.

As can be seen in the illustration, the body of the wheelbarrow is simply one-half of an oil drum which has been cut in two by means of a blowpipe, the cutting being done in accordance with the necessary safety precautions for such work. Each oil drum, therefore, can be made into two bodies. The frame and handles are made from ¾-inch scrap pipe. In the case of the wheelbarrow shown in this illustration, an old cultivator supplied the wheel.

The half barrel is placed in the pipe frame at such an angle that the contents are perfectly level when the workman stands up straight. Those who have to push the wheelbarrow around claim that this type is a great improvement over the conventional style, particularly for moving mixed concrete.

In the fabrication work, of course, the bending of the pipe to the desired shape as well as all of the welding is carried out by means of the oxy-acetylene flame.



In connection with the cutting of the oil drums, there are certain safety precautions which must be observed. *The drum must be thoroughly cleaned out before any open flame is brought anywhere near it.* Steaming with live steam will remove any trace of volatile liquid such as gasoline or oil; scrubbing with lye solution will take out heavier oily materials. When certain that the container is absolutely clean, flush it with water thoroughly, and then keep it as full of water as possible until the cutting operation is completed. Always make sure that the drum is thoroughly vented to permit the escape of air or gases that become heated during the blowpipe operation. Whatever the cost, *make absolute-certain yourself that the drum is cleaned and vented before doing any work on it at all.*

It's Time-Tested!

that's why you take no chances with the VOLT-O-MATIC GENERATOR

IT'S more than 20 years since the first Volt-O-Matic Generator was built with full automatic voltage regulation. Now experience has taught thousands of fleet owners that this is the only type of generator which delivers the trouble-saving, money-saving benefits listed at the right.

Experience has taught something else. It has taught fleet owners to take no chances with anything less than the time-tested Volt-O-Matic Generator. *Time-tested*—its design has been improved to masterpiece perfection over a period of almost a quarter of a century. *Time-tested*—such delicate precision in craftsmanship could only be acquired through years of know-how. *Time-tested*—even the materials, specially developed for the purpose, reflect a singularly intimate knowledge of the technical problems involved and of fleet service requirements. Write for booklet about Volt-O-Matic Generator.

VOLT-O-MATIC GENERATORS
assure you of these . . . and more!

1. Provide full automatic voltage regulation
2. Furnish all electric current—*instead of the battery*—to lamps, horns, wipers, etc., whenever the engine is running
3. Protect the battery against over-charging or insufficient charging
4. Definitely prolong battery life
5. Assure you of steady lights, safer horns, easier starting, improved ignition—hence better performance
6. Practically eliminate the hazard of road breakdowns due to battery and generator trouble
7. Minimize maintenance costs . . . savings often amount to hundreds of dollars a year

UNITED AMERICAN BOSCH CORPORATION

SPRINGFIELD, MASS. NEW YORK CHICAGO DETROIT

LETTERS TO THE EDITOR

COMMENTS ON REGROOVING

● *Dear Mr. Fischer:* I have read your editorial entitled *"Exit Baldies"* on page 16 of the May issue, and wish to offer the following comment:

1. *Regrooving of tires materially reduces the ultimate mileage of the tire due to the rubber being removed.*

2. *Regrooving, while it has some slight benefit on pulling traction, has little, if any, on stopping traction.*

3. *These facts have been determined by the writer by actual tests and are supported by some tire manufacturers and some fleet operators. Other tire manufacturers and other fleet operators disagree with this claim.*

However, the writer is very certain that the matter of benefit to be derived from non-skid tread as an accident-preventive measure has been greatly overemphasized, and to allow it to be a matter of compulsory legislation would be a grave mistake.

In the writer's opinion, the effect of non-skid tires on safe driving is largely psychological, and as a result a false belief in the safety afforded might, due to its creation of a reckless tendency, actually produce an accident hazard instead of an accident-preventive condition.—*Clinton Brettell, Supt. of Garages, R. H. Macy & Company, New York, N. Y.*

●

OPEN LETTER TO MR. BRETTELL:

● *Dear Mr. Brettell:* We appreciate your comments on our editorial entitled *"Exit Baldies"*. . . . Naturally, it pleases us very much to know that our editorials are read by men of such high standing as your good self.

But we do not agree with you when you say that the value of a non-skid tread is negligible, from the standpoint of safety, whether on a new tire or produced by retreading or regrooving.

You seem to be one of a very few fleet operators who actually entertain this opinion. We could point out the fact that *all* new tires are furnished with non-skid treads. And we could also claim that many of the large tire manufacturers are using regrooving tools in their schools, in their mileage departments and in their own service stations.

Your opinion seems to hinge, *not* on the question of regrooving, but on the value of a non-skid tread from the safety standpoint. We certainly would not try to talk you out of your opinion, to which every man has a right. Rather, let us make a "survey" to determine the answer to this question, through the medium of our Question-of-the-Month department. The questionnaire will appear in an early issue.

When the replies are in, and a concensus of opinion is obtained, the writer will be pleased to personally present you with a copy of our findings, regardless of the outcome. And our readers, too, will share the benefits of this controversy, as we will publish a feature article on the subject shortly thereafter.—*H. Clay Fischer, Editor,* FLEET OWNER, *90 West Street, New York, N. Y.*

●

THANK YOU, MAJOR!

● *Dear Mr. Fischer:* I am enclosing one of your latest questionnaires properly filled out. May I embrace this opportunity to thank you for your courtesy in forwarding the magazine, FLEET OWNER, to me at regular intervals, as it is of great assistance in keeping up-to-date in automotive maintenance which is a very important factor among my many duties.

It would be a pleasure on my part to reciprocate in furnishing data available for release to you in connection with Army motor vehicle operation.—*E. H. Besse, Major, Q. M. C., U. S. Army, Fort Hayes, Columbus, Ohio.*

"PLEASED AND DISPLEASED"

● *Dear Mr. Fischer:* Due to illness I neglected to mail in my answers to your Questions Number 71, 73 and 74 in the Question-of-the-Month Club. I have quite a few of your very neat answer summaries and really would like, if I can manage to wheedle them out of you (in spite of the fact that I don't deserve them) copies of the above summaries.

In the past I have been alternately pleased and displeased to find that, as one of the smaller fleets replying, I have been in or out of "the swim" with the big fellows. Even when I am "out" I don't always agree with them, but certainly look my "out" methods over very carefully to see what's wrong.

Seriously, the Question-of-the-Month Club is a great idea. Do you want answers where experience doesn't warrant them?—*T. A. Williams, Blinn, Morrill Company, Boston, Mass.*

●

NICE COOPERATION

● *To the Editor:* We are enclosing the circulation blank which you asked us to fill out and want to tell you how much we appreciate your sending us your up-to-date magazine every month.

Although we do not operate a large fleet of vehicles, we are interested in those of others, and the advancements in the new trucks as they come out.

We will be glad to cooperate with you in any way, in order to keep our name on your mailing list.—*W. M. Albright, General Contractor, Greensboro, N. C.*

●

"ANXIOUS FOR NEXT ISSUE"

● *Dear Mr. Fischer:* I have been reading your magazine, FLEET OWNER, for a few years and surely do get a lot of valuable information from it. In fact, I am always very anxious for the next month's copy. I take this opportunity of thanking you for the same.

I have charge of a fleet of 20 trucks and cars.—*Melvin R. Wissler, c/o Charles Kungler Company, Lancaster, Pa.*

●

LIKES OUR SYSTEM

● *To the Editor:* In reading over the May issue of FLEET OWNER, I am very much pleased with your offers to provide your readers with various copies of advertising pamphlets.

I believe that such a system as yours goes a long way toward making friends of your magazine, as well as acquiring constant readers.—*V. F. Curtis, Asst. Manager, Marshall Field & Company, Chicago, Ill.*

THOUSANDS of satisfied motorists agree that Zurnoil is "tops" in motor lubrication.

And sleek Zurnoil trucks have the same beautiful finish that gleams on thousands of trucks all over the country—Du Pont Automotive DULUX.

Fleet operators have found that DULUX cuts paint costs down to a lower point than ever before reached . . . and helps build business at the same time.

DULUX is tough and durable. It stands up magnificently under the punishment every truck finish must meet—all kinds of weather, traffic gases, grease and oil stains, bumps and bangs. It is amazingly resistant to chipping, cracking and corrosion. Because it *is* so durable, DULUX keeps trucks out of the paint shop for a longer time, saves repainting costs.

At the same time, smart-looking trucks finished with DULUX are handsome advertisements for the company they represent. They give people a good impression wherever they're seen on highway or street.

You can apply DULUX to your trucks right in your own shop, with either brush or spray. Or else, an Authorized DUCO-DULUX Refinisher can do it for you.

Ask a du Pont representative to call and explain just how DULUX will cut your painting overhead down and keep your trucks fresh and bright. E. I. du Pont de Nemours & Co., Inc., Finishes Division, Refinish Sales, Wilmington, Delaware.

DU PONT
REG. U. S. PAT. OFF.

AUTOMOTIVE DULUX

REG. U.S. PAT. OFF.

An Interesting Job for All-Around Use

THE Rochester Carting Company of Rochester, N. Y., takes pride in the all-around service and time-saving features of its truck equipment. This is no better exemplified than by this new traffic-type Mack recently placed in service.

This truck is equipped with a platform-type body which, by means of an underbody hoist, is raised and lowered for loading and unloading heavy materials. A "Diamondette" plate, mounted around a winch on the level with the body, forms a platform for the operator of the winch.

When machinery is being pulled up on the body by the winch, the body can be supported in a raised position by means of two 20-ton jacks which are permanently affixed to the rear of the body. For the unloading of large pipe and similar material the body is raised to its full height, thus greatly facilitating the unloading.

●

Employee-Contact Through the Bulletin Board

OF the various mediums that management has available to convey messages and instructions to employees as a whole, none probably has been so long honored by widespread use as the company bulletin board. *"Employee-Contact Through the Bulletin Board,"* a report recently issued by the Policyholders Service Bureau, Metropolitan Life Insurance Company, indicates that many companies look upon the bulletin board as one of the most effective means of quickly putting flash messages before employees and, conversely, as an excellent medium for keeping continuously before them campaigns on safety, waste reduction and similar topics.

Seventy companies contributed information concerning their policies and practices. Manufacturers, railroads, utilities, retailers, and distributors are represented. How important the bulletin board is considered as a means of employee-contact may be suggested by the fact that 11 companies reported that the responsibility for bulletin board policy and for review of material for posting is assumed by officials of the company. In 12 other cases either the personnel or the safety director is held responsible.

It is pointed out in the survey that one of the most important factors in the effectiveness of a bulletin board is the location. From this angle the problem is comparable to that faced by billboard advertisers who must see to it that the greatest possible percentage of people in a given territory will be exposed to the message the board contains. With the bulletin board there is an additional necessity of getting across somewhat longer messages on occasion and that calls for locations free from undue congestion. Of the various locations mentioned by companies contributing to the survey one of the most popular seemed to be that in individual departments, generally near a drinking fountain. Such locations, it was pointed out, permit specialized departmental messages when occasion requires.

Another location frequently used is that near exits and the timeclocks, although it was pointed out that the hurry and congestion at such points might detract from their usefulness as bulletin board sites. The face of the timeclock itself is used in many cases for brief official messages which must be seen by all employees who register on the clock.

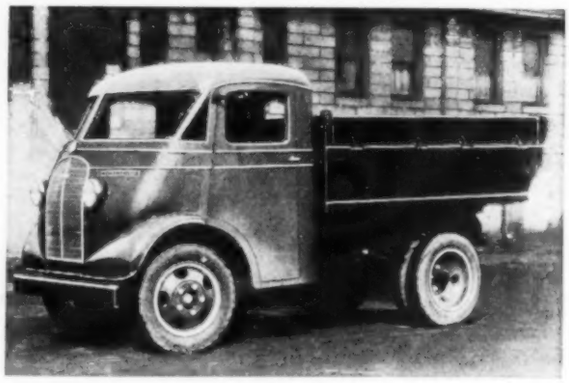
The survey material shows that in industrial companies the nature of the material posted followed these averages: Safety, 53%; Instructions, 17%; Group insurance, 13%; Health, 8%; Social, 7%; Inspirational, 1%; Employees' Advertising, 1%. The percentages are somewhat different for commercial companies: Instructions, 42%; Safety, 25%; Social, 18%; Group insurance, 7%; Health, 7%; Employees' Advertising, 1%.

The report *"Employee Contact Through the Bulletin Board"* deals also with such details as methods of checking effectiveness, number of boards with relation to number of employees, types of board used. Copies of the report may be had by addressing Policyholders Service Bureau, Metropolitan Life Insurance Company, 1 Madison Avenue, New York, N. Y. . . . Mention of FLEET OWNER always helps.

●

Dodge Offers New C.O.E. Dump Truck

ANNOUNCEMENT is made of a short wheelbase truck with a new cab-over-engine conversion and special dump body on a 1937 Dodge chassis.



This special body is mounted upon a 1½-ton Dodge truck chassis with a 108-inch wheelbase. The dump body side is hinged horizontally for greater capacity and ease in loading ashes and other bulky materials. The slanting rear gate also gives it slightly greater load space. It is equipped with a hydraulic hoist.

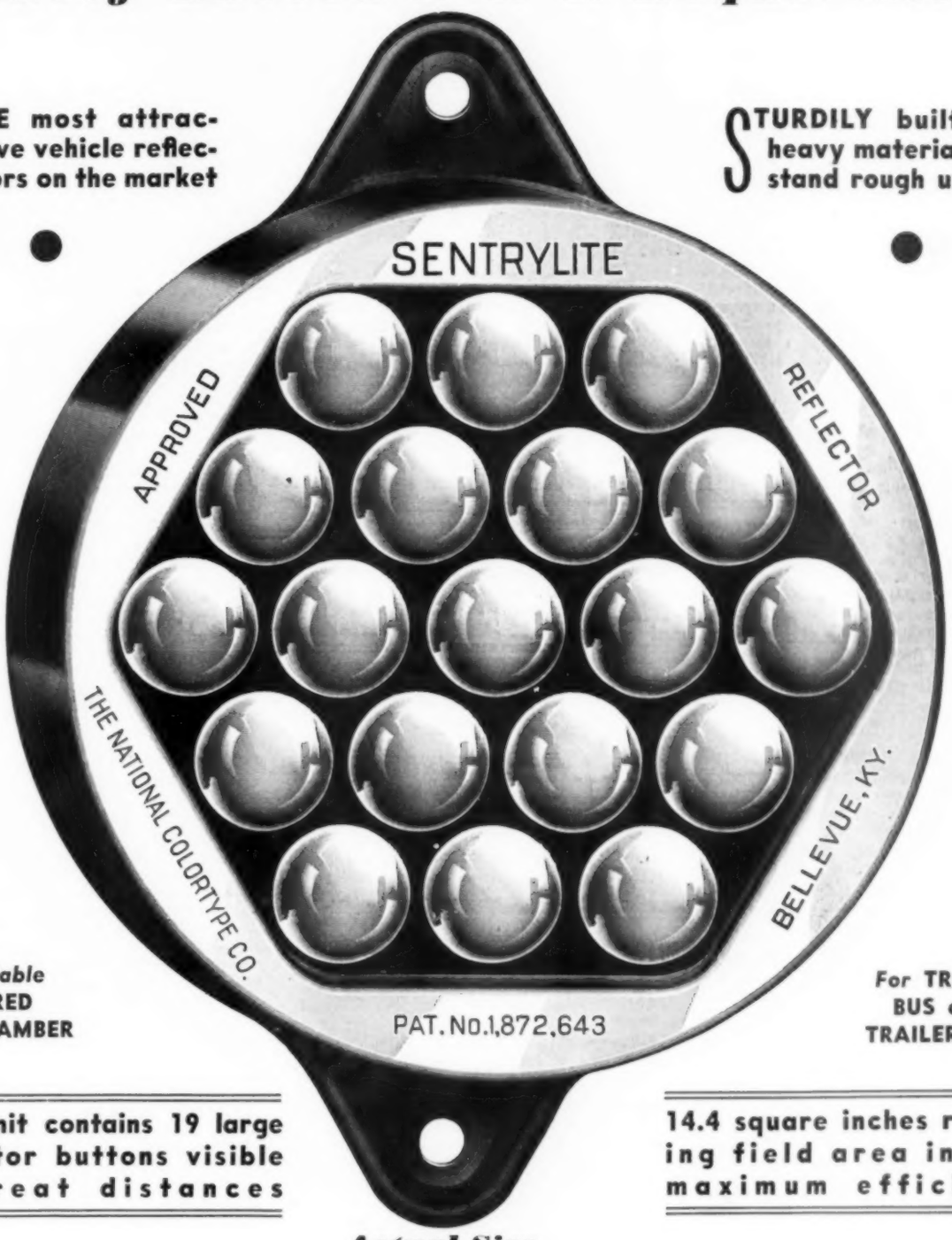
This particular unit is to be used in city work, although it is adaptable for numerous other purposes. The short wheelbase provides small turning radius and greater facility for handling in location where little space is available. . . . For further details address Joseph Burke, c/o Dodge Truck Division, Chrysler Motors, Detroit, Mich. . . . Mention of FLEET OWNER is always appreciated.

APPROVED Sentrylite REFLECTORS

Greatly Exceed I. C. C. Requirements

THE most attractive vehicle reflectors on the market

STURDILY built of heavy materials to stand rough usage



***Available in* RED *and* AMBER**

For* TRUCK, BUS *and* TRAILER *use

Each unit contains 19 large reflector buttons visible at great distances

14.4 square inches reflecting field area insures maximum efficiency

Actual Size

Sold through Distributors and Jobbers. Official I. C. C. Safety Regulation Guide furnished without charge by your Sentrylite dealer on request. Write for Descriptive Literature.

THE NATIONAL COLORTYPE COMPANY

Sole Manufacturers

BELLEVUE, KENTUCKY • *Opposite* CINCINNATI, OHIO

LITERATURE
THAT'S NEW -- *and* FREE!

THE following numbered selections have been chosen by Editor Fischer as this month's trade literature offerings. . . . These booklets are GUARANTEED to be interesting and are offered NOT on the basis of producing inquiries for advertisers, but on THEIR OWN MERITS as handy reference data. . . . If you don't believe it, send for a few of them and prove it to yourself. Do not confuse this page with the voluminous conglomerations found in ordinary (the other fellows') magazines. . . . The post-card is for your convenience. No postage required.

343. "THIS UNMATCHED SAFETY". . . . That is the title of a full-sized, 24-page booklet which explains the many causes of different types of highway accidents and does it in a graphic, interesting manner. . . . It further attempts to show how certain types of trucks are safer, with particular respect to four-wheel-drives, inter-axle differentials, safety-sealed cabs, tight exhaust lines, fire-hazards, etc. . . . No. 343 brings you a free copy of this valuable safety story. promptly and free.

•

344. SMALLER DIESEL TRUCKS? . . . Yes sir, those long-awaited "small" Diesel-powered trucks are now here, in 2-ton and 2½-ton nominal ratings. . . . An interesting booklet completely illustrates and describes them and gives, in simple terms, the various features of the Diesel engines used and the performance possibilities that you can expect in normal, every-day operation. . . . Diamond-T has just issued this booklet and if you haven't seen it, Number 344 on the attached post-card will bring you a free copy promptly.

•

345. OIL-FILTER DATA. . . . Perfect oil-cleaning at lower cost is promised in this interesting bulletin, which describes the line of H-W and Duo-Flo filters and shows how a new type of cartridge replaces the felt filters in older models, and is used in the newer models. . . . The inexpensive replacement of this type of cartridge is a feature that ought to inspire you to send for this free bulletin. . . . Number 345 on the post-card brings it promptly.

•

346. DRY-ICE REFRIGERATION. . . . An interesting semi-technical volume illustrates and describes a brand-new thermostatically-controlled truck refrigeration unit which uses "dry-ice" as the refrigerating medium. . . . You will find this bulletin interesting because it clearly explains how the new unit works and shows how easy it is to install it in the average insulated truck body. . . . Keep posted on refrigeration-methods by asking for Number 346 on our post-card. . . . There's no obligation in connection with *anything* on this page.

•

347. BALL BEARING MANUAL. . . . Just off the press is this ball bearing manual which, in addition to listing all ball bearing applications, gives valuable instructions on Bearing Selection, Mounting Directions, Fits and Tolerances, Equivalent Bearing Tables, and other handy data. . . . The Manual has 146 pages and an attractive "wire-o" binding, with tabs at each section for easy reference. Number 347 on our post-card places you in line to receive a copy of this manual, free and by mail.

348. ELECTRIC BRAKES FOR TRAILERS. . . . If you operate any trailers at all, you'll surely be interested in learning more about electric brakes—a product that really is *new*. . . . An interesting broadside gives cut-away views, shows the operating parts, and tells in a few words just how electric brakes work. . . . Number 348 on our post-card brings a free copy of this broadside promptly.

•

349. LUBRICATION CHART. . . . Here's one that's *different!* Instead of giving chassis diagrams, showing you where the rear-axle is, for instance, this chart gives cut-away views of *all* important units that need to be lubricated—it shows all types of transmissions, rear-axles, universal-joints, water-pumps, steering-gears, etc., and portrays the path of the lubricant, type of fitting, etc. . . . It also gives certain recommendations as to the *type* of lubricant to be used in each case. . . . Just the right size to post permanently on the wall without being too obnoxious, this chart comes to you free, if you mention Number 349 on our post-card.

•

350. TRUCK-LAW SLIDE-RULE. . . . When you want to know just how long, wide or heavy your vehicles must be to operate in a certain state, you don't have to hire a transportation expert. . . . Not if you have one of the latest Size & Weight Slide-Rules, which is offered here free and gratis. . . . Just slip the slide to the state in mind, and Presto!—the law before you lies. . . . Number 350 on the post-card brings one of these free time-savers by early mail.

•

351. DOUBLE YOUR LOAD SPACE? . . . It's as easy as it sounds, if you use half-tonners and if your loads are light and bulky. . . . An interesting 8-page folder, issued by one of the truck makers, shows how this is done by using the new "conversion"-type, streamlined over-all panel bodies. . . . Bakeries, laundries, dry-cleaners, dairies, florists, and other "door-to-door" operations will find this material extremely interesting. . . . Number 351 on the post-card brings a free copy promptly.

352. POWER FROM THE WIND. . . . You can eliminate battery troubles due to under-charging, by letting the breeze keep your batteries charged as you bowl along the highways. . . . Wind-chargers, which have proved so popular with farmers, trailerites and fleet operators are illustrated and described in this new pamphlet which emphasizes low prices and tells how they work. . . . Number 352 on the post-card brings this free literature.

•

353. ELEMENTS OF FIRE. . . . A comprehensive treatise (without advertising) is this 16-page mimeographed booklet (8½ x 11) which tells you a lot of things that perhaps you didn't know about fire—its chemical and physical aspects—with emphasis on proper protection against all types of fires. . . . Safety engineers in fleet operations will find this especially valuable, although you don't need to be an engineer to get a copy. Just mention Number 353 on our post-card and it's free.

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354. RING-FREE LUBRICATION. . . . Here is "the inside story" of "Ring-Free" Lubrication, beautifully portrayed in a set of broadsides designed to acquaint you with this particular make of lubricating oil. . . . A special broadside on Diesel engine lubrication is especially interesting. . . . Acquaint yourself with up-to-date information on the controversial subject of motor oils, by getting these broadsides for your files. . . . Number 354 brings them, free, gratis and promptly. . . . The post-card is for *your* convenience.

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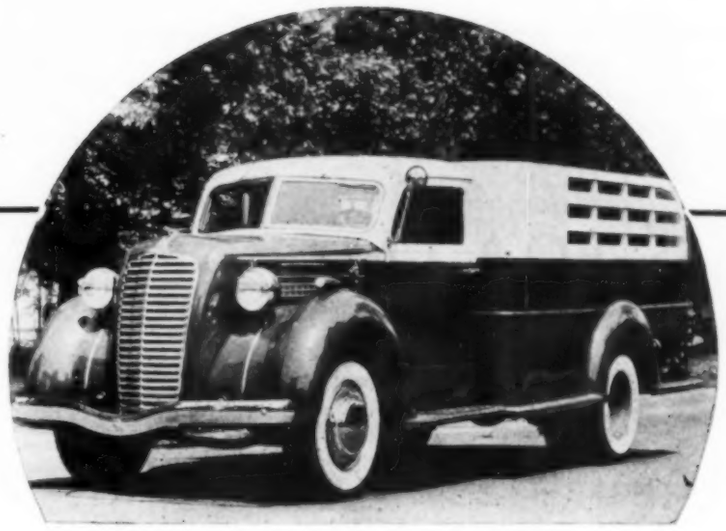
355. BATTERY SERVICE MANUAL. . . . Give us credit for correctly representing this book. Its title is just what it is, since it contains chapters on Automotive Electrical Check-ups—Selection of the Right Size Battery—Charging Data—Battery Capacities—Battery Repair—Generator Adjustment—and others. . . . There's no advertising or sales-promotional material in this manual. . . . It's interesting and will be supplied *free*, if you mark Number 355 on our post-card above.

THESE ARE OFFERED ON THEIR OWN MERITS—THE POST-CARD SAVES YOUR TIME



Diamond-T Offers 1 to 1½-Tonner

FOR the large field between the "commercial-car" and the heavy-duty 1½-ton truck, Diamond-T has announced a new 1 to 1½-ton model with a list price of $595. The new truck presents an array of interesting features of construction, and is also noteworthy for its ability to take a full ten-foot body on the standard wheelbase of 135 inches.

Model 301, as it is called, is powered by a newly-developed six cylinder engine built by the Hercules Motors Corporation to Diamond-T specifications. The characteristic features of the larger heavy-duty engines are retained and construction includes the usual seven-bearing crankshaft, large side-mounted water pump, full-depth cooling, gear-driven front-end and pressure lubrication to both mains and rods. Bore and stroke are 3⅜" x 4⅛" and N.A.C.C. rating is 27.34 horsepower. The actual output is 66 horsepower at 3,300 r.p.m. and maximum torque is 151 lbs. ft.

Engine mounting is the special four-point "cushion cradle" rubber suspension with torque arm to isolate engine vibration from the frame. A special linkage allows clutch and brake pedals and master cylinder to be rigidly attached to the frame and unaffected by movement of the engine and power line.

Side-rails are 6⅛" deep, of ¼" stock, and are reinforced by straight X-sections of eight inches maximum depth and three additional cross members, including wide steel tank-support of special design. At the rear of front springs and the front of rear springs, where the greatest stresses are concentrated, the X-member joins the side-rails with extra gusseting to provide maximum reinforcement. The strength and stiffness of this frame far exceeds normal requirements, it is claimed.

Diamond-T engineers have produced a type of springing for Model 301 which is said to give exceptional driver comfort. Houdaille hydraulic shock absorbers are standard equipment in front and front springs which are 38" long and 2" wide were especially designed to work with them as a unit.

The rear springs are under-slung and of the progressive type with stiffness increasing in proportion to load. Only the upper section is used when truck is empty and the lower four leaves add the necessary capacity for loads and eliminate the danger of "bottoming." As a result, the truck has "soft" riding qualities and the frame and spring design allow a low center of gravity with a loaded frame height only 22½" above the ground with standard tires.

TOP New Diamond-T 1-½-tonner, Model 301, with 10-foot standard panel body . . . The lower view shows the new 6-cylinder Hercules engine, built to Diamond-T specifications, with bore and stroke of 3-⅜ x 4-⅛ inches. Displacement is 221 cu. in.

Other specifications indicate a consistent program to reduce routine maintenance and upkeep costs. Spring shackles, for example, continue the use of compression-type rubber bushings, which require no attention for lubrication for the entire life of the truck. The two-piece propeller shaft has three needle-bearing universal joints and the intermediate bearing is a double thrust Timken roller, cushion-mounted in rubber to allow the necessary flexibility. The clutch is of large capacity, 10" in size and is provided with a self-lubricated throw-out bearing which requires no attention.

Standard wheels are 16" in diameter and tire options in this size include 7.50-16" with duals rear. Where larger tires are needed or greater clearance is desired, 20" wheels can be furnished with optional tire sizes to 32 x 6", 8-ply.

Model 301 is equipped with the newest Lockheed, hydraulic internal-expanding brakes on all four wheels. Brake drums which are cast of fine grained steel are 14" in diameter and 2" in width, except when 20" wheels are furnished, in

(*Please turn to page* 72)

New N-Type Purolator

THE new "N-Type" Purolator oil filter illustrated here is offered in two sizes—one for engines to 6-quart crankcase capacity; the other for engines having crankcase capacities from 7 to 10 quarts.

This type of Purolator is made up of an outer case or container, inside of which is a replaceable filtering unit, or cartridge. The cartridge fits into the outer case in such a manner as to form a perfect seal, to prevent unfiltered oil getting into the outlet.

Dirty oil is forced into the case and up through a central tube running through the center of the element. It then passes to the oil distributing chamber which distributes the oil evenly throughout the filtering medium, which is of the absorption type. As the oil passes through, all carbon is absorbed, and sludge, dirt and abrasives are completely trapped, it is claimed.

In addition to removing all contamination from the oil, the makers state that this new Purolator keeps the oil clear and with its original color, thus giving "visible" proof of complete filtration. Cartridges are changed in a matter of seconds, without tools.

For further details address Motor Improvements, Inc., Newark, N. J. . . . Mention of FLEET OWNER will be appreciated.

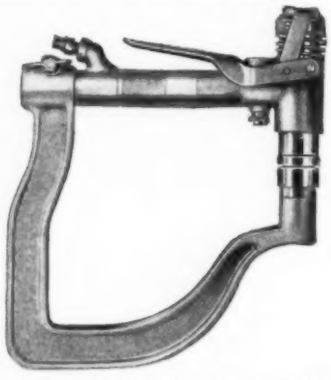
•

Chicago-Pneumatic Fender Iron

HERE is a new device for removing dents from fenders. It is a pneumatic fender hammer, made by one of the oldest manufacturers of pneumatic tools.

The CP Fender Iron, as it is called, is an improved finishing tool, for smoothing out dents, wrinkles and rough spots on damaged automobile fenders and other sheet metal parts. It is recommended for use after the preliminary roughing-out or shaping of the damaged part, but when the metal is not too greatly distorted, it may also be used for the roughing-out operation.

A spring-controlled lever instantly raises or lowers the hammer to the work. Control is simple and positive. The outfit is furnished complete with built-in pressure regulator and throttle, two yokes with different reaches, one hammer die and 5 assorted shaping dies, 50 feet of air hose and wooden rack for holding dies.



For interesting circular describing this new tool, address Chicago Pneumatic Tool Company, 6 E. 44th St., New York City. . . . Mention of FLEET OWNER will speed up the service.

•

Wilco Piston Ring Gauge

THE Wilco Ring Gauge, illustrated here, measures all ring sizes on the same center line. The picture shows how it draws the ring against an angle which automatically maintains the same center line for all rings.

Neither moving parts nor the measuring tape are involved in adjusting the ring gauge, since the scale is set at the factory to read correctly. The tape is made of Swedish steel and is fastened securely at each end to prevent stretching; therefore adjustment is seldom needed. Readings are made on a dial through a magnifying glass. Undersizes and oversizes are indicated in tens of thousandths.

A master size ring is furnished with each instrument so that the accuracy of the reading can be checked at any time. If necessary, adjustment of the dial reading is made simply by moving

the scale to the right or left, so that it points exactly to the size on the dial corresponding to the size of the master ring. The dial and all working parts are enclosed.

This instrument is mounted on an inclined base for easy use. It measures all rings from 2 inches to 6-3/16 inches in diameter, covering the entire automotive field as well as most of the larger truck and tractor sizes. . . . For further information address Wilkening Manufacturing Co., Philadelphia, Pa. . . . Mention of FLEET OWNER always helps; sometimes it speeds up the service.

•

New Hind-View Mirror

THIS new mirror is of the pull-out extension type. It may be extended to 22 inches (standard models) and special models can be furnished with an extra long arm permitting extension to 30 inches.

This mirror has a 5-inch diameter face, highly polished. Extension gives any desired length by simply releasing and tightening a set-screw.

To alter the angle of adjustment, a simple touch of the hand is necessary, and the bracket remains in the set position, revolving in its own ball socket—up or down, front or back.

This mirror can be easily installed on door-hinge, cab body or fender. When not needed in its full length it can be pushed in. When extended, the mirror "sees" far around the trailer or body.

For further details address Whitehead Stamping Co., 1661 W. Lafayette Blvd., Detroit, Mich. . . . Mention of FLEET OWNER always helps.

Eliminates Battery Corrosion

THIS is a paste for applying to battery terminals, called "Korode-Kure." According to the maker, this product will immediately dissolve all corrosion that may be present and will *prevent* any *further* corrosion.

The paste may be laid-on or painted on. It has the consistency of a light grease but its color is black. When applied as a paint, it is recommended that battery boxes, containers, terminals, fittings and cables be so treated.

It spreads easily and will not attack any metal, wood or painted surfaces, the makers claim. It is available in tubes, pint and quart cans. It is non-explosive and may be applied with a brush and is not harmful to battery solution itself.

For further details and small sample address Battery Specialty Company, Cheshire, Conn. . . . Mention of FLEET OWNER always helps.

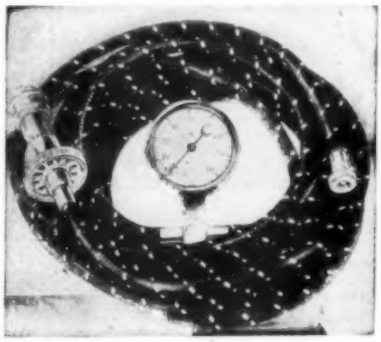
•

Schrader Spark Plug Pump

A. SCHRADER'S SON has recently added a Spark Plug Pump to their line, so called because it screws into the plug opening in the motor—inflates all types of tires, air mattresses, rubber boats and air pressure tanks, for spraying trees, paint, etc.

The Schrader No. 8888 Spark Plug Pump has a wide range of possible uses. It makes excellent equipment for truckmen, bus operators and farmers when tires require air far from a service station—encouraging the immediate correction of under-inflation instead of risking damage to tires by riding on a soft one to the nearest service point.

Any gasoline motor of two or more cylinders will operate it. Interchangeable adapters make one pump fit any standard plug opening. Construction of the pump unit is care-



fully engineered to assure quickest possible inflation and to pass only clean, cool air. The opposite end of the pump hose is fitted with a tire-valve connection. Tires can then be quickly inflated by running the motor at idling speed.

A standard set consists of sixteen-foot length of hose, pump with one adapter and pressure indicator. The device is also available in twelve- foot lengths without the indicator. Five adapters that fit pump to all standard spark plug openings, may be purchased separately, or as a set for service work. Additional 12-foot lengths of hose may be purchased if desired.

For further details address A. Schrader's Son, Division of Scovill Mfg. Co., 470 Vanderbilt Ave., Brooklyn, N. Y. . . . Mention of FLEET OWNER always helps.

•

"Tu-Eth" Tire Regroover

THIS new regroover, called the "Tu-Eth", (named after its inventor) is of the pull-type, employing a U-shaped cutting knife and an electric heating unit. With it, tires can be regrooved inflated, uninflated or even on the vehicle.

The cutting knife is made of Swedish steel and is available in five different widths, ⅛, 3/16, ¼, 5/16, and ⅜ inches. Depth of cut is easily adjustable by placement of knife in bracket. Two brackets (for optional knife sizes) are supplied with each outfit, together with 6 blades of each size chosen—12 blades in all.

The heating unit is contained in the seamless steel tube which comprises the frame. Heat is drawn from the hottest point of the unit and there is no danger of overheating, it is claimed.

The knife bracket can be adjusted at any point on the frame and set to stay put. The guide arm likewise can be set to give proper control, especially in making annular grooves. Handles are of maple. Additional equipment includes a Swedish steel file for keeping knives sharp and a special Allen set-screw wrench.

All sizes of tires can be regrooved with this tool. For further details and interesting circular giving more data, address Vanderbilt-Osborne Corporation, Raymond-Commerce Bldg., Newark, N. J. . . . Mention of FLEET OWNER always helps.

•

Universal Wheel Puller

A UNIVERSAL puller that will pull wheels, axles, gears, bearings, steering wheels, and motor pulleys is the latest tool to be made available by the Wagner Electric Corporation,

St. Louis, Mo. The tool is known as the Frisz Universal Puller, and consists of various combinations of the main body casting and high carbon steel adapters that can be assembled to serve the various pulling operations of the tool.

The parts of this new puller are so designed that the fleet operator may purchase just enough parts to pull wheels, and afterwards add the parts to pull axles—and still later add the parts to pull gears and bearings.

The wheel puller parts alone are known as Assembly F-17. The entire assortment of parts for all functions is known as F-9. The illustration shows the F-17 Combination for wheel pulling. . . . For further information address Wagner Electric Co., 6480 Plymouth Ave., St. Louis, Mo. . . . Mention of FLEET OWNER always helps.

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American Bosch Fog-Light

UNITED American Bosch Corporation, Springfield, Mass., is offering the fog-light illustrated here as an auxiliary driving-light for trucks, buses and passenger-cars.

It is intended for mounting below and between the head-lights, and provides a triple-beam, semi-circle of light in front of and around the vehicle.

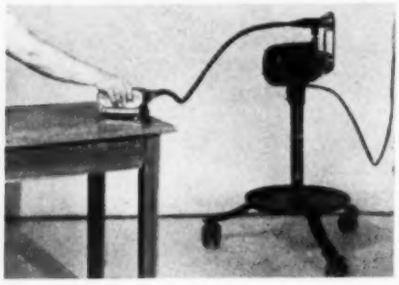
Corrugations in the upper, middle and lower sections of the heavy glass lens produce this triple-beam, which floodlights both sides of the road, ditches and the center of the road up to 30 feet in front of the vehicle.

This is not just a "spot-light" with an amber lens. The bulb is masked and the tilted prism lens diffuses and floods the light so that there is a minimum reflection from fog, since all three beams are directed downwards and underneath the main fog blanket. The makers claim that this light will illuminate the road in dense fog. Available for 6 or 12-volt current.

A simple, rigid mounting is provided, the wide spread making a movable mounting unnecessary. Finish is in all-chrome, or chrome-and-black. . . . For further details, prices, discounts, etc., address United American Bosch Corp., Springfield, Mass. . . . Mention of FLEET OWNER always helps.

Sterling Electric Sander

AN electrically-driven sanding machine is announced by Sterling Products Company. This sander is driven by electric motor through a flexible shaft, and is *not* intended to



replace the air-driven model manufactured by the Company; it is simply added as a companion model.

The sanding action is reciprocal with ⅝" travel of the sanding pad, at speeds from 1750 to 2800 complete oscillations per minute, depending on the type of work. This movement is said to duplicate the natural back-and-forth motion of hand sanding and rubbing.

A floating principle is applied to the block by means of special flexible rollers made of composition rubber and fabric. Due to this construction there is no restriction in the movement of the block, and the machine is applicable to curved and flat surfaces of metal, fabric, wood, composition, leather, marble, etc. It is adaptable to wet or dry sanding.

The machine is portable and may be operated from either 110 or 220 volts. From one to five sheets of abrasive may be attached to the pad at one loading; ordinary size sheets are cut in three pieces to fit without waste. . . . For further details address Sterling Products Co., Curtis Bldg., Detroit, Mich. . . . Mention of FLEET OWNER is always appreciated.

•

New Puncture-Seal Tube

A PATENT covering an inner tube which seals punctures in tires while the car is in motion has been issued to The B. F. Goodrich Company.

The puncture-proof inner tube is made with a layer of plastic self-sealing composition on the inner side of the tube. Holes are closed without loss of air when the penetrating object is removed, it is declared.

The Goodrich product, known as the Seal-O-Matic tube, has been subjected to more than four years of actual road service on thousands of passenger cars and trucks, according to the manufacturer.

In a number of instances reported to the company users have removed scores of nails, screws and other articles from tires after months of uninterrupted operation and without loss of air pressure.

The new tube is moderately priced. Complete details will be sent on request. Address B. F. Goodrich Company, Akron, Ohio. . . . Mention of FLEET OWNER always helps.

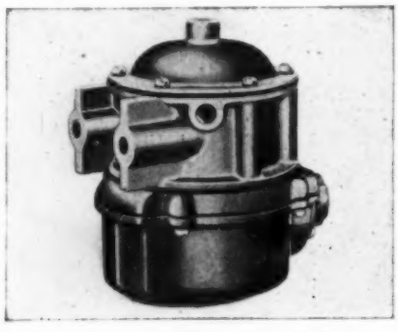
•

Universal Relay Valve

THERE are at present two major types of vacuum-powered brake installations in use on tractor-trailer combinations. These are called the "atmospheric-suspended" or single-line, and the "vacuum-suspended" or double-line types.

The Bendix Universal Relay Valve, illustrated here, has been developed in order that tractors and trailers having dissimilar types of vacuum-power brake installations may be operated together and their brake operation synchronized. It is installed on the trailer, and ports leading to all control chambers are brought to the outside of the valve, so that connections may be easily changed in adapting the trailer to various tractors.

As its name implies, this valve is a Relay Valve, and incorporates the quick action and accurate graduation



features typical of Bendix B-K Vacuum Brakes. It is so designed that the same pressure difference will always exist over both tractor and trailer power cylinder pistons, irrespective of whether the tractor and trailer carry the same, or different types of power brake equipment.

Thus, the use of this valve will provide, it is claimed, brake operation always properly synchronized, provided, of course, that the tractor and trailer power-brake equipment has been installed according to proper cylinder, leverage and hookup specifications. For further details address Bendix Products Corporation, South Bend, Ind. . . . Mention of FLEET OWNER will speed up the service.

•

Hall Valve-Seat Inserts

THE Hall Manufacturing Company offers a new and complete line of Hall "Motor-Metal" and "Chrom-Steel" valve seat inserts.

The Hall line of valve seat inserting and grinding equipment is well known to the trade and, according to M. T. Obee, sales manager of the Hall Company, it was only after repeated requests from the service trade for a line of valve seat inserts for installation with Hall equipment that they decided to market these parts.

Hall "Motor-Metal" seat inserts are individually cast of a special alloy which has the same co-efficient of expansion as the motor block but because they are harder and closer grained they will stand up far longer than the original cast-iron seats, it is claimed.

The "Chrom-Steel" seat inserts are individually cast from a special alloy of chromium and molybdenum which

has many of the characteristics of high speed steel. Because they retain their hardness, even when red hot, without warping or distortion, they are recommended for use in all heavy-duty motors.

Both types of Hall seat inserts are available in several outside diameters for every inside diameter. This makes possible the use of these seat inserts for both initial and replacement installation. . . . For complete details address Hall Manufacturing Co., 1620 Woodland Ave., Toledo, Ohio . . . . Mention of FLEET OWNER is always appreciated.

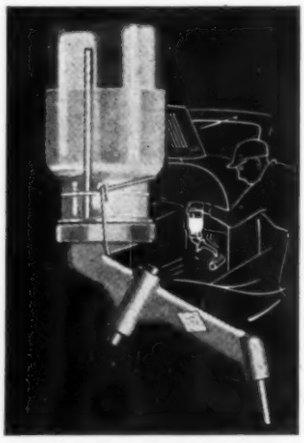
•

Brake Cylinder Refiller

AN improved type automatic brake cylinder refiller is being featured by the Wagner Electric Corporation, St. Louis, Mo.

This handy little refiller is fully automatic. It fills the cylinder to the proper level, and then flow of fluid stops—automatically. No overflow is possible. Cylinder cannot be pumped dry, nor can air enter system, it is claimed.

Design is such that this refiller reaches the most inaccessible master cylinders. All the mechanic has to do



is to insert the nozzle in the filler opening and allow the refiller to do the rest. Uses no more brake fluid than needed, effects real economies and is clean and economical, the makers state.

Fleet operators will find this refiller a great aid in dispensing brake fluid quickly and economically. Complete information will be furnished on request by the Wagner Electric Corp., St. Louis, Mo. . . . Mention of FLEET OWNER, when writing, will speed up the service.

Slide Rule Offered Free

A NEW Slide Rule showing truck and trailer restrictions in each of the 48 states has recently been brought out by the Fruehauf Trailer Company, Detroit, Mich. The new Slide Rule is printed green, and replaces the red one put out last year by the Fruehauf Company.

This latest edition has been brought up to date as of April, 1937. Truck and trailer operators may obtain one of these Slide Rules *free* by writing to the Fruehauf Trailer Company, 10900 Harper Avenue, Detroit, Mich. . . . Mention of FLEET OWNER, when writing, will be greatly appreciated.

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Handbook Explains ICC Law

EXPLAINING in brief but complete detail the Interstate Motor Carrier Law, and also the various laws relating to commercial carriers as formulated by the individual states, a new "*Handbook of the Interstate Motor Carrier Law*" has recently been published.

The authors are two practical counselors-at-law and I. C. C. practitioners—David Brodsky and J. A. Lieberman. Their extensive experience in motor transportation law is said to give them a practical knowledge of the intricate federal and state regulation.

The "Handbook" is written in easily understandable language and is divided into two parts. Part I is a comprehensive discussion of the practical application of the Federal Motor Carrier Act. . . . Part II deals with the requirements of the 48 states, regarding interstate for-hire and private motor carriers.

This volume is perhaps the most up-to-date one yet issued. It contains over 180 pages, 6 x 9 inches, with flexible binding. Details are brief and surprisingly complete. Published by Milbin Publishing Company, 140 W. 22nd St., New York, N. Y. The price of this handbook is $3.00.

•

New Lubrication Chart

A PICTURIZED chassis lubrication chart, designed to show fleet operators the lubrication requirements of trucks and busses, as well as to guide the procedure of service station attendants, has recently been issued by the Socony-Vacuum Oil Company, 26 Broadway, New York, N. Y.

The chart combines detailed information and instructions for the lubrication of every part of all trucks and busses. It is unique in that it contains pictorial representations of the various chassis parts so that the operator as well as the attendant may get a clear conception of the lubrication needs of his vehicles.

Describing the new chart, E. F. Hallock, manager of the Socony-Vacuum Oil Company's automotive engineering department, stated:

"The few truck and bus lubrication charts heretofore used by service stations have been conceived almost entirely with a view to guiding the attendant in a step-by-step lubrication procedure. The use of these charts has been limited to certain models. The new picturized chart covers *all* types of trucks and busses.

"The new chart is adapted to modern lubrication practices. It is based on the principle that the various parts of modern trucks and buses can be classified under a number of specific types, and that these types can be grouped according to lubrication requirements. Each type of transmission, steering mechanism, generator and water pump, together with all other parts requiring lubrication, are pictorially represented with cut-away

illustrations. These show the point of application and path of the lubricant, as well as the type of lubricant to be used.

"These illustrations are in turn keyed with a chassis diagram in the center of the chart so that the location of each part may be readily ascertained. Thus the fleet operator can see what lubricant is to be used. He is shown what the lubricant has to do with the unit in question and why that particular type of lubricant is required."

On the reverse lower panel of the chart are engine, transmission and differential recommendations for all trucks and busses, as well as capacities for specific makes and models. In case the truck or bus employs a unit other than that used for production, the recommendations and capacity of such units can readily be ascertained from this tabulation.

The new Socony-Vacuum chart is not only issued for the guidance of station personnel in the lubrication of all motor trucks and busses, but it also permits a flexible lubrication procedure for truck and bus servicing where certain models have different parts, varying from standard production units.

In addition to the truck and bus chart, the company has issued a new passenger car lubrication chart designed along similar lines. Requests for free copies should be addressed to E. F. Hallock, Socony-Vacuum Oil Company, 26 Broadway, New York, N. Y.

•

FWD Fire-Apparatus Book

"APPOINTED to the Service of Saving Life and Property" is the title of an interest-provoking new booklet describing FWD fire-apparatus used by the New York Fire Department, recently published by the Four Wheel Drive Auto Company.

With "bleed" photographs, and a striking color plate on the front page, the booklet is filled with pictures of New York's new aerial ladder trucks, and is informative with its story of the activities of New York's firemen.

Explanatory material describes modern methods of fire-fighting, and a description of the June, 1936 dedication of the new fire-apparatus to fire-fighting service. A minimum of advertising copy, and 99 per cent of the story devoted to fire-fighting, are the booklet's features.

Copies may be secured by writing Four Wheel Drive Auto Company, Advertising Department, at Clintonville, Wis.

•

S-W Touch-Up Enamels

IN addition to their regular line of automotive enamels, the Sherwin-Williams Company has introduced a new line of Kem X-47 Touch-Up Enamels in colors and gloss to match the original factory finish on Plymouth cars for 1936-37.

These are offered in handy 5 oz. cans for use in touching up minor scratches or other damage to the finish of the car. By an immediate touch-up of the damaged finish, rust will not form at the scratch and protection against finish deterioration is insured. Each can includes a brush of good quality and size, making it easy to reach the more inaccessible parts because of the length of the brush.

The Kem X-47 Touch-Up colors are made in the regular quality of Kem X-47 Enamels and have the same natural gloss, adhesion and covering power. They are ideal for cutting in,

level out to a smooth finish free from brush marks, and dry dust-free in an hour, it is claimed. For further details address The Sherwin-Williams Company, Automotive Division, Cleveland, Ohio.

U. S. Safety Activities

(*Continued from page* 21)

demned. Rewards and penalties are definitely stated. No cards are held back. The newcomer has them all before him at the start. From then on we make it our business to see that he follows instructions.

When the driver becomes involved in an accident, the Safety League Council "moves in", in no uncertain way. The whole incident is re-enacted with miniature vehicles in accordance with sketches and blueprints which record the course of the vehicles involved. The whole story is built up from the driver's own written report; the information gained from witnesses, if any; and the assertions of others directly involved. A hearing is then called at which the driver is quizzed as he would be by a regimental or garrison court-martial and he is subsequently exonerated or penalized according to his innocence or guilt. These meetings are presided over by the manager of the affiliated company or division, and present also are the company claim agent and insurance representative.

For driving without chargeable accident the league awards its members as follows: first, a silver pin of unusual design, accompanied by a letter of citation, at the end of the first six months; second, a gold pin of the same design and a certificate at the conclusion of the first year; third, at the close of the second year of continuous safe driving service at the wheel, a gold watch, engraved with driver's name and the emblem of the league, and a certificate.

To keep the subject of safety constantly in the forefront of every driver's mind the company publishes *Cross Roads*, an eight-page, monthly, tabloid-size newspaper. In *Cross Roads* we strive to discuss only such subjects as will interest readers, who are mainly our drivers. We try to maintain a personal touch in feature articles and columns, news articles, and in all of the illustrations accompanying them. *Cross Roads* is being read and we know also that interviews, special articles, editorials, and quarterly safety report tabulations are helping to improve the driving practices of our men.

Additional educational activity on safety results from banquets of the league, which are held periodically for making awards to drivers. Speakers are prominent authorities on safety.

In the meantime, inspection and maintenance of equipment are followed with constant precision and vigilance to make sure that all equipment can be relied upon while in operation. A newly established department of preventive maintenance has standardized all inspection and repair work policies and practices in company and division garages from Chicago east. We anticipate that the work of this new department will have an important bearing on safety by eliminating the possibility of failure of equipment while enroute.

In brief, then, that is the outline of our program, stripped of mention of the detail work involved.

●

Oil Filters Prove Worth

(*Continued from page* 29)

Crankshaft—Rod-journals showed a maximum of .0005" wear; this is considered normal or better.

Connecting-rod Bearings—Condition, good; clearance, .003" to .0035"; no adjustment was necessary.

Main Bearings—Condition, o.k.; no adjustment was necessary.

Timing Train—Condition, good; showed slight wear; normal.

A sample of the oil in the crankcase at this time was then sent out for test, and for comparison with the specifications of the *same* oil before being used. The following was noted:

	Crankcase Sample	New Oil
Gravity	28.9	29
Flash	250	465
Fire	450	525
Viscosity @ 100...	394	600
Viscosity @ 210...	60.5	74
Dilution	3%	...

The sample tested showed a slight trace of black, sludgy sediment, but was absolutely free of any solid matter or abrasives. The color of the oil was slightly darker than that of the new oil.

The inside of the crankcase and oil-pan showed only a film of dirty oil or discoloration. No solid matter was present in the pan nor was any sludge in evidence anywhere except in the valve chamber and there in such a small quantity as to be negligible. Oil lines were clean and free from deposit.

No evidence of an "acid" condition was to be found; shaft, pins, etc, were all free from any traces of pitting, etching or corrosion.

Conditions in the combustion-chamber were normal with the exception that carbon formation was somewhat less than usual as gauged by our experience with similar engines at corresponding mileages.

The condition of the crankcase, of course, showed a very great improvement over what we had been finding upon opening a motor and the absence of all valve trouble was quite unusual.

While the mileage in itself is low it should be remembered that the time-element is rather great and with the strain of continual short-haul, stop-start operation, these conditions make the test a quite severe one.

After replacing the rings with new ones, and grinding the valves, the engine was filled with new oil and again put into service. Since then it has given us another 10,000 miles of the same satisfactory operation, up to this writing (June, 1937).

While we do not advocate such long mileages between oil-changes, we do believe that such and longer mileages are entirely practical with good oil and oil filters. We have installed oil filters on our other equipment and aside from the actual net saving in oil-cost, due to less frequent oil-changes, we benefit from a harder-to-figure but nevertheless tangible saving in repair expense. And we have better running engines that require less tuning and valve work.

●

The Case for the C.O.E.

(*Continued from page* 30)

6. Greater driver comfort.

Shorter Overall Length:—This feature has always been desirable in a utility vehicle but in recent years has become imperative. The increasing density of traffic on our highways and congestion in streets have pointed to the need for shorter vehicles. The adoption of length regulations has merely given added emphasis to this need.

Shorter Wheelbase:—Here again the advantage of a small diameter turning-circle for trucks has always been recognized. With the conditions existing today, what was once merely an interesting idea has now become an operating necessity.

Improved Weight Distribution:—This condition has only recently received proper consideration. In the early days of the truck, when solid tires were in general use and speeds were low, little attention was paid to this factor. As far as tires were concerned, there was no need of considering tire exchange between front and rear wheels. This made it possible to balance the load on each wheel with a tire of appropriate size. It was also possible to have a smaller diameter tire in front than on the rear, which made it relatively easy to get the "wheel-cut" needed to obtain a minimum turning-circle. With the advent of pneumatic tires it was convenient, at least, to have the same size tire front and rear and, with dual tires on the rear wheels, the loads, front and rear, should be in the ratio of one to two. To do this with the conventional truck requires an excessively long wheelbase which is objectionable in many ways. On the Engine-Under-Seat or the Cab-Over-Engine design it is simple.

Reduced Frame Stresses:—This is one of the factors implied in the previous paragraph. In the conventional truck, due to the location of the front axle relative to the front of the body, the maximum bending moment is adjacent to the front of the body while on the Engine-Under-Seat or Cab-Over-Engine truck it is some distance back of this for the reason that the front axle is located only a short distance ahead of the front of the body. At the same time the shorter distance between axles reduces the value of

the bending moment which means a reduction in stress and deflection for the same frame section or a smaller section for equal stress and deflection.

Distinctive Appearance:—The elimination of the conventional hood permits the development of distinctive appearance which is undoubtedly of commercial value in this day when even pens and safety razors are "streamlined."

Greater Driver Comfort:—Cabs are more easily ventilated, vision is better, riding is better and driving generally is easier with the shorter vehicle. Admittedly these are "general" statements, which some may take exception to, and the characteristics may not be achieved in every vehicle. For instance, if the wheelbase is made too short the ride will not be so good as it might be. However, in our experience all these things compare favorably with the equivalent conventional vehicle, and drivers who have driven both types testify to these facts very generally.

As stated, these desirable attributes of short wheelbase have been evident and are not new. However, it required a combination of favorable development to make them attainable.

In the first place, increasing congestion of streets and highways made the operator conscious of the length problem. At the same time the public also became aware of the situation and legislation appeared which brought the matter to a head.

The growth of improved highways and engineering staffs for the design and construction of these highways gave rise to studies of the effect of loading on the roads and to consideration of means for controlling loads. The result was a rather general adoption of wheel or axle loads as the basic control. In many cases with a distribution of weight one-fourth front and three-fourths rear, as was general on conventional trucks, the limitation of the rear axle weight made it impossible to attain the permissible total vehicle weight. Changing this distribution to one third-front and two-thirds rear, holding the same rear axle weight, increases the total vehicle weight 12.5%. A larger portion, and in some cases all, of this increase can be put into payload.

Steering gears have had a continuous development through a number of years which has resulted in the production of units capable of handling the increased front axle loads just mentioned.

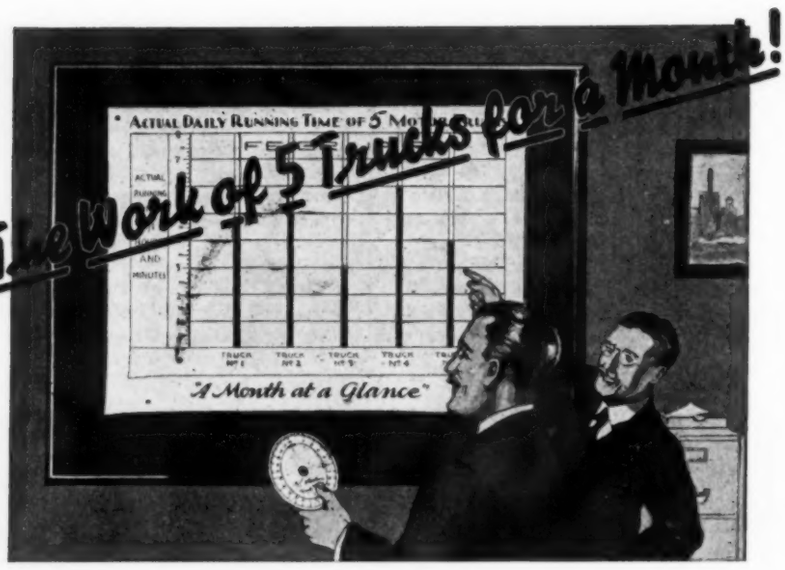
Before the adoption of front-wheel brakes there was a definite reason for keeping rear axle loads high in order to provide the necessary braking ability. With brakes on all wheels this limitation was removed. For the same reason, viz. to provide adequate traction, when solid tires were in use, high rear wheel loading was needed. The development of the low pressure pneumatic tires, with greatly improved traction characteristics, has made it possible to reduce loads on the driving wheels and still obtain the needed traction.

The question may arise as to why at least some of these desirable features cannot be obtained on a conventional chassis. Let us analyze the thing and attempt to provide the answer. In a conventional truck with, say 184-inch wheelbase, and a weight-distribution of ¼-¾, the wheelbase will have to be increased to 207 inches to produce 1/3-2/3 weight-distribution, using the same body. And the turning-circle will thereby increase to 78 feet. This example is given, applying to a truck of the older type, with the front axle well forward.

In a modern type of conventional truck of the same size, with the front axle moved back 13 inches, the wheelbase is now reduced to 171 inches, but to obtain the desired weight-distribution the rear axle must still be moved back 17 inches, thus increasing the wheelbase to 188 inches and the turning-circle to 72 feet; but this reduces the over-all length by 10½ inches.

Using a body of the same dimensions, the Engine-Under-Seat or Cab-Over-Engine construction will give

43 to 1
45
40
35
30
25
20
15
10
5
1
43 to 1 – a somewhat mysterious headline perhaps, but one which, nevertheless, emphasizes an important point. This ratio represents the results of a test in which a journal of 2 in. diameter was run in a white metal bushing at 500 r. p. m. and 230 lbs. per sq. in. load. Oil was fed to the assembly until stable conditions of lubrication were obtained. The supply was then cut off and the bearing seized in 30 minutes. The experiment was repeated, but this time oil containing "dag" colloidal graphite was used. The journal ran for over 20 hours before tightening in the bearing was noted. This test indicates that graphoid surfaces, possessing low friction properties, will, for surprisingly long periods, safeguard against metal-to-metal contact during breaks in the lubricating film. Write for copy of Booklet 600 describing "dag" colloidal graphite.
Ask your oil supplier about his colloidal-graphited oils today
ACHESON COLLOIDS CORPORATION
PORT HURON MICHIGAN
dag
COLLOIDAL PRODUCTS
COLLOIDAL GRAPHITE
"DAG" COLLOIDAL GRAPHITE IS A 100% AMERICAN MADE MATERIAL
ACHESON COLLOIDS CORP., PORT HURON, MICH.
Please send gratis, story on "dag" Colloidal Graphite and copy of "cigarette paper" test.
NAME.....
ADDRESS.....



How Much of the Day is Each Truck **ACTUALLY RUNNING?**

• That's really the answer to the question: "Are my trucks efficiently operated?" Not how many miles—but *how busy*, every day and all day.

Very Few Know

the answer to that question, yet it is the most important information of all—idle time, delays, waste, etc. Well-organized concerns are beginning to feature this "busy-idle" information in their records. The best way of all is to make a graphic picture of it as shown above, obtained from the charts produced by the *Servis Recorder*—all running time and standing time, day or night, for a month. One picture is worth a thousand words, or a thousand figures for that matter. Suppose you are operating five trucks and were shown a graphic chart like that pictured above. Would it not mean more to you than all the figures that your bookkeeping department could produce?

That Wall Chart

represents a week, or even a month of truck operation, and can show the comparative performance of a whole fleet at a glance. Then you'll know where to correct abuses such as idleness, avoidable delays, faulty routing, unnecessary overtime, speeding, accidents, etc.

Write for our SKY-LINE Chart and also our free booklet "Ten Ways of Getting More Work Out of Motor Trucks."

THE SERVICE RECORDER CO.
1422 Euclid Ave., Cleveland, O.

The Servis Recorder
Tells Every Move Your Truck Makes

the required weight distribution, reducing the over-all length some 51 inches, the wheelbase 56 inches and the turning-circle to 42 feet.

From what has been presented in this paper it will be seen that this construction permits the realization of some very valuable features, both of an engineering and operating nature. There is little wonder, therefore, that this type of vehicle has had such a general recognition and acceptance in these last few years, among trucks of various manufacture.

Fleet Lubrication

(*Continued from page* 34)

or less heavy-duty service of motor vehicles the percentage of dilution is relatively small, generally ranging 1 to 7%.

Impurities that originate within the engine itself consist mainly of small metal particles worn from the engine, core-sand drillings, and metal chips loosened by the hot oil, vibration and metal expansion, and in some cases iron oxides resulting from the corrosion of various interior surfaces.

As a prevention is always preferable to a cure, it should be the first concern of the fleet operator to prevent as many of these various impurities from entering the crankcase as is possible. First, he should only use oil of a high degree of purity. Second, he should make certain that both the carburetor and ventilating air filters are of an efficient design and that they are periodically properly cleaned and serviced. Third, that the engine is maintained in good mechanical condition at all times. The practicing of preventive maintenance will do much to make the latter effective.

Perhaps none of these impurities exists in crankcase oil individually in a sufficient quantity to cause serious trouble. So it is not the individual impurity acting alone but rather the combined action of all of them that may cause serious trouble. Moreover, it is more likely their mutual effect on one another that causes trouble. Undoubtedly some of them combine chemically to form entirely new compounds while others mix mechanically. It is this combined chemical and mechanical mixture that is generally called sludge, the character of which varies widely, depending on both the original oil and the extent to which it has been exposed to foreign impurities. It has been proved that impurities promote and accelerate oil oxidation and sludge formations.

In spite of all precautions that an operator might take, impurities will gradually accumulate and eventually reach a point where the oil becomes unfit for further use unless means are provided for their removal. This, as previously pointed out, is not due to the oil wearing out, but because it has become contaminated with those detrimental impurities, which are likely to clog oil ducts, grooves, passages, and pipes as well as to cause ring and valve sticking and excessive wear. Sludge is usually of an acid nature and if permitted to collect for any appreciable period may cause corrosion especially to the highly polished surfaces of the barrel, piston, rings, rods, and crankshaft.

It is evident that dirty oil cannot and does not lubricate as satisfactorily as clean oil. It has been appreciated ever since the very early days of motor vehicles that the removal of these impurities is essential in order to avoid lubricating troubles.

Figures 1 and 2 are photomicrographs (x443) of oil removed from the crankcase of a passenger vehicle after 1,000 and 3,763 miles respectively of operation. They clearly show the effect of service on the quantity of impurities present. It will be noted that the particles in Fig. 1 are very small and separated, while in Fig. 2 they have formed agglomerates.

Figures 3, 4, 5 and 6 show the effect of service on some of the properties of an oil used in a passenger vehicle. From Fig. 3 it will be noted that the film breakdown pressure in-

creased with use, and was in all cases greater for the used than for the new oil, reaching a maximum of 7,000 lb./sq. in. at the end of 350 miles of operation. The hemacytometer count, shows practically a uniform increase, reaching a maximum of 13,605,000 particles per cu. mm. after 3,763 miles of service.

Shown in Figure 4 are the neutralization and precipitation numbers of the same oil. Both of these curves show a more or less gradual increase as should be expected. Likewise, as shown in Fig. 5, the ash and iron content and carbon residue show increases.

As to be expected, and as shown in Fig. 6, there is no definite trend of viscosity and dilution. There is however, a rather definite correlation between viscosity and dilution. In practically all instances where viscosity increases, dilution decreases and vice-versa. This is, of course, as we should expect and demonstrates that changes in viscosity are mainly caused by dilution.

From the foregoing illustrations and discussion it is obvious that any refiner, would, to say the least, have considerable difficulty in recognizing his own product after it had been subjected to a few hundred miles of service in the average crankcase of a motor vehicle. Moreover, it hardly appears necessary to say that some device so constructed that it will tend to remove the various impurities would be a decided advantage in motor vehicle operation.

(EDITOR'S NOTE: In the second installment of this article, which will appear next month, Professor Clower will take you through the various types of oil-filters that are commonly used in fleet operation. He will illustrate and describe the principles and claims of advantage of each. It should make *very* interesting reading You'll be looking for it, won't you?—H. C. F.)

●

Streamlines Save Fuel

(*Continued from page* 42)

and required twenty-seven books of gold leaf for the lettering.

With the body beautifully built by Smith Brothers of Toronto, Ontario, Canada, and mounted on a Fruehauf semi-trailer, the unit has an overall length of 35 feet, a width of 96 inches. Weighing 17,000 pounds empty, the unit carries eighty-five half-barrels of beer for an eight-and-a-half ton payload, the limit under Ontario law.

The truck maintains a speed of about 42 miles per hour with full load of 35,000 pounds at the governed speed of 2,400 R.P.M. With a wheelbase of 109", the job is equipped with 9:00-20 tires, powered by a White six-cylinder 318 cubic-inch engine with a five speed 42-B transmission, fifth direct.

In addition, the streamlined White has Bendix-Westinghouse air-brakes, a pair of fog-lights by Trippe of Chicago, and a 50-gallon gasoline tank mounted on the right side.

These complete units are owned and operated for private enterprise in the service of John Labatt Limited, Brewers, London, Canada.

Editor's Note: We are presenting this interesting data, first, on its merits as "news" and secondly, because we feel that the fair test which revealed the practical advantages of streamlined design, from the standpoint of speed and economy, will provide an answer (at least in part) to the many questions asked as to the actual merits of modern styling.

Two New Assistant Service Managers

CHEVROLET announces the appointment of two new assistant general service managers. . . . E. L. Harrig, formerly service and mechanical manager in the Atlantic Coast Region, goes to the Chevrolet central office as assistant service and mechanical manager in charge of service operations. . . . F. L. Frazier, formerly service and mechanical manager in the Southwest Region, becomes assistant service and mechanical manager in charge of mechanical operations. . . . H. L. Shaw succeeds Mr. Harrig; J. W. Sodders takes over Mr. Frazier's former duties.

THIS NEW
REFRIGERATOR LOCK
WILL PLEASE YOU TOO
KRAFT'S
Miracle Whip
Salad Dressing
KRAFT
and here are the reasons
1—Handle is automatically locked in closed position. Driver can't forget to lock it. Requires key to open.
2—New bolt mechanism pulls door in tight against packing when closing, and breaks frost seal with big leverage when opening.
3—Lock mechanism located inside door.
4—Push-button handle release eliminates breaking or bending of key.
Now furnished for Right or Left-Hand Doors. Ask for No. 5633 Quick-Lock.
EBERHARD MANUFACTURING CO.
Division of The Eastern Malleable Iron Company
CLEVELAND, OHIO
EBERHARD "Quick Lock"
REFRIGERATOR DOOR LOCK
WRITE FOR THE NEW 1937 EBERHARD CATALOG.
E

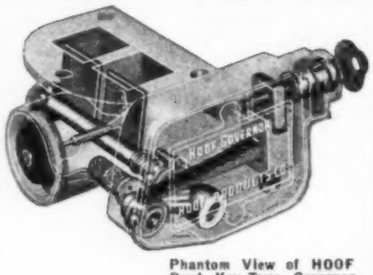
HOOF GOVERNORS Give You POSITIVE INSURANCE Against Speeding

● One sure way to stop speeding and reckless driving is to install HOOF GOVERNORS on every automotive vehicle in your fleet, including company passenger cars.

Thousands of fleet operators maintaining cost records know that this means of safeguarding automotive equipment is saving millions of dollars in death claims, property damage, delays and destruction of expensive equipment and contents.

HOOF GOVERNORS will also save a great percentage of your operation and maintenance costs.

Fatal accidents begin at 40! Control your entire fleet with HOOF Cantilever Spring GOVERNORS. This, and other exclusive HOOF features, insure absolute control and permanency of speed setting, giving full torque or pulling power under all conditions. They are unaffected by climatic conditions or dust. Tamper-proof against all known means.



Phantom View of HOOF Dual Key-Type Governor

THREE Advanced Types of Hoof Governors

—HOOF "Key-Type" Governors . . . speed can be changed only by person having key.

—HOOF "Dash-Control" Governors . . . speed can be changed from the dash only, by holder of key.

—A. C. H. "Seal-Type" Governors . . . protected by the tamper-proof HOOF Seal.

Ask for FREE 64-page Governor Manual and Supplement.

HOOF PRODUCTS COMPANY

162 NO. FRANKLIN STREET — *Cantilever Governors* — CHICAGO ILLINOIS

Corrosion Inhibitors

(*Continued from page* 36)

lubricating oils caused by this overheating condition thus contribute to fuel and oil waste.

On the other hand, should the cooling system be kept free of rust and scale formation, by using water of *known* quality, or by otherwise treating it with rust and corrosion inhibitors, water softeners, etc., normal efficiency of the motor can be maintained.

Exact tests made by interested authorities have revealed three conditions attributable to the operation of motors using a hard, untreated cooling system water. These are:

1. Premature replacement of cylinder heads, cylinders, pistons, piston rings and valves.

2. Unduly high oil and fuel consumption.

3. Low operating efficiency of internal combustion engines.

These tests have shown further, that by removing the scale and rust from water-jackets and radiators of cooling systems, increases from 59 per cent to 150 per cent in the heat absorbed by cooling water, per rated horsepower, have been obtained.

In other tests, conducted over a period of six months, between motors heavily scaled and motors free from scale, savings of from 35 per cent to 51 per cent in lubricating oil consumption were noted. These tests were conducted on internal-combustion engines used for steady heavy-duty work.

Engineers of General Motors Truck Company, The White Company, and other truck and passenger car manufacturers, we are told, have recently investigated the use of treated water in cooling systems, and as a result, have made specific recommendations.

There are various materials on the market for cleaning cooling systems, for inhibiting the formation of rust and scale, and for treating water to neutralize the effects of hard, foreign materials. It would not be good "ethics" to list them here, but if you are interested in learning more about the subject, just drop a line to the Editor and we will be glad to see that the desired information is sent to you promptly, and without obligation.

●

What Over-Drive Offers

(*Continued from page* 40)

the truck comes to a slight grade, or enters traffic or even encounters wind-resistance so that it cannot continue to pull in high. Ordinarily it drops back to third, even though third is lower than necessary, with a considerable reduction in road-speed and quite possibly a little engine racing on the part of the driver anxious to maintain as much road-speed as possible. Suppose, however, instead of dropping back to third, he can drop back halfway—to over-drive third—a gear lower than high but higher than third. There is considerable to be said for this and its value is apparent.

To put the value into figures, we can take the speed of a typical truck. In high, its normal highway speed is 46 miles per hour, in third it is only 27 miles per hour—a loss of 19 miles per hour. But with an auxiliary transmission it would have a halfway between speed of 35 miles per hour. In other words, it gains 8 miles per hour by using this type of over-drive gear. The figures for different trucks vary of course, but typical figures are about as follows: Over-drive third is 8 miles an hour faster than third; over-drive second is five miles an hour faster than second; and over-drive first is 3 miles faster than first.

The operator on a scheduled run with perishable freight to deliver on time will appreciate what this means, especially if he has much grade on his route. And he need not be afraid of that destroyer of engines, "lugging." These three over-drive gears are all lower than his regular high gear, so if his engine does a good job of pulling in high it will certainly pull even better in these over-drive

gears. Engine power has nothing to do with it when we consider high gear as the only basis of comparison.

The fourth over-drive gear, over-drive high, has the same characteristics as the passenger-car and truck-transmission overdrive. That is, it reduces engine speed while it maintains high road speed; or, it maintains engine speed while it increases road speed. Perhaps the best way to show this is by figures, so here are the figures typical of one make and model of truck:

Engine RPM in High	Truck Speed	Engine RPM Over-drive High
2,420 RPM	35 MPH	1,860 RPM
2,760 "	40 "	2,120 "
3,110 "	45 "	2,390 "

If we are making 45 miles an hour in high gear, the engine is running 3,110 RPM, so we shift to over-drive high; the truck still makes 45 miles an hour, but the engine is running only 2,390 RPM. We begin to save engine revolutions at the rate of 43,200 per hour. Quite a sizeable saving, and we get a smoother, quieter running, and perhaps a cooler engine and of course, we save some gas and oil.

Or, the other way we can use this over-drive high gear is, instead of loafing along at 35 miles an hour and turning the engine 2,420 RPM to do it, we can shift over into over-drive high and breeze along at 45 miles an hour and run the engine at about the same speed as before we shifted. To be exact, we can cut it a little; we only have to run it at 2,390 RPM.

Of course, this gear, being higher than the regular high, is not so good for pulling with a heavy load, so it comes into play principally when the truck is going home empty or proceeding light-loaded. No matter when or how used, it's a gas saver and it cuts down the wear on rings and pistons and has a good effect on the valves and the engine in general.

Aside from these matters of time-saving and economy for the truck operators, there is another consideration which is particularly timely, and that is the matter of safety. One of our friends was talking with the Director of Safety for the Interstate Commerce Commission. Assuming no responsibility for the correctness of his opinion, and only quoting his words, he said that the Commission's investigations have revealed that the lack of speed of trucks on grades materially impedes other traffic and also contributes to accidents. He points out that because a truck has to crawl up a grade, drivers of passenger-cars become incensed, undertake to go around the truck and collide with a vehicle coming from the opposite direction.

Now under certain conditions *some* trucks will *always* crawl up some grades. However, a difference of 5 or 10 miles an hour when climbing a grade is not to be lightly over-looked and very possibly under certain conditions it may be a considerable aid to the safety of other vehicles.

In this connection I quote from an article appearing in the *Los Angeles Times* of May 31, 1937. This is from a reporter's account of his ride on an express truck from Los Angeles, to Phoenix, Arizona. "Hitting the first grade this side of Pomona, Joe keeps his eye on the tachometer—never does he let the revolution counter get under the 1,500 per minute mark before changing to a lower gear. The second the needle begins to fall he flicks the two gear-levers to the next lower ratio." I happen to know that this truck is equipped with an auxiliary transmission having under-drive *and* over-drive.

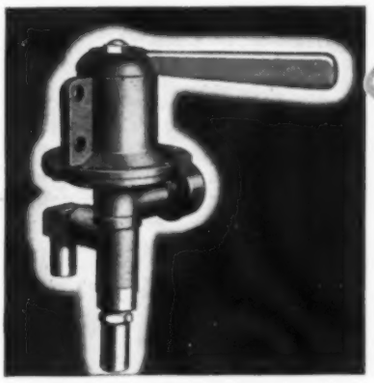
Now that is real truck driving. It is getting over the road, grades and all, in the shortest and most efficient time. It is only possible when a truck is equipped with plenty of gears. The under-drive and over-drive auxiliary transmission produces 12 speeds forward. Among these twelve speeds the auxiliary over-drive takes its rightful place as a remarkably useful improvement for the motor truck. Truck operators who are looking for efficient operation—and most of them are—will do well to stop thinking of over-drive in connection with speed and start thinking about it as pulling-power and a time-saver—which is what it really is.

DOES YOUR BRAKE EQUIPMENT COMPLY WITH NEW I·C·C RULES?

TO PREVENT TRAILER BREAK-AWAYS

Showing Midland's check valve, relay valve, and vacuum reservoir.

For the protection of your own property—and to guard against damage of other's—you need Midland's positive-action trailer brake equipment. In the event the trailer is disconnected from tractor, the trailer brakes automatically lock, holding trailer stationary far in excess of the time required by law. You can't afford *not* to have this equipment! Be sure with Midland power brake equipment. It complies with all state and federal laws.



Showing Midland's hand control valve.

FOR INDEPENDENT TRAILER BRAKE CONTROL

The new law requires a trailer brake control that is separate from the service (foot) brake. Midland's compensating hand control is the answer. With it, brakes may be applied with any degree of pressure. You can slow down gradually—or come to a quick-acting emergency stop. See your nearest Midland dealer today. Let him make sure that *your* fleet complies with the new safety regulation laws.

THE MIDLAND STEEL PRODUCTS CO.
10609 MADISON AVENUE • CLEVELAND, OHIO

MIDLAND POWER BRAKE EQUIPMENT

MIDLAND (CHRISTENSEN) Power Brakes

FLEET OPERATORS USE SCHRADER GAUGES

FOR ACCURATE TIRE PRESSURES

No. 6060
Service Gauge

Fleet service schedules require that tires be checked regularly, some as often as three times a day. For this type of work, service men need a tire gauge that can be used almost continually with unvarying accurary.

Schrader Tire Gauges are known for their outstanding dependability. Their minute accuracy is maintained, even in severe service, by the famous "direct-action" principle.

To be sure of maintaining correct tire pressure, even in a road emergency, equip each of your vehicles with a Schrader Gauge. Regularly used, it will pay for itself many times over.

There is a Schrader Tire Gauge for your particular requirements. Order from your regular supplier.

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Division of
SCOVILL MANUFACTURING COMPANY, INC.

Schrader
REG. U. S. PAT. OFF.
TIRE GAUGES

Crescent Company Wins Safety Award

THE Crescent Company, Pawtucket, R. I., manufacturer of popular "Wiry Joe" automotive cables, has received a Certificate of Merit from its insurance company for having completed 218,000 man-hours without a lost time accident. . . . Since the period covered by this award, The Crescent Company has operated for 40,000 additional man-hours without a lost time accident . . . a total of 258,000 man hours. Mr. Milton C. Sapinsley, General Manager, is justly proud of this record.

•

Uses Trailers to Demonstrate Products

VACUUM Power Equipment Company, Detroit, Mich., is now using several display trailers to demonstrate the actual vacuum braking equipment which it manufactures. . . . These trailers are calling on fleet operators and distributors throughout the country, manned by trained sales engineers and traveling from Maine to Texas. . . . Meetings are held within the trailers, where the complete line of "Vel-Vac" equipment is on display and in operation.

•

Municipal Bus Terminal in Hackensack

THE CITY of Hackensack, N. J., recently opened its new municipal bus terminal, which is now being utilized by several bus companies operating more than 600 buses per day in and out of that city. . . . City Manager Rich estimates that an average of 675 buses per day will use the terminal facilities, accommodating upward of 75,000 passengers per month, and that charges against the privately-owned bus lines will be sufficient to pay the cost and maintenance of the terminal.

DIETZ
GARAGE FLOOD LITE

Every Fleet Garage needs the Dietz Garage Floodlite. It is rolled about on the floor under trucks, also used to illuminate repair or grease pits. Has handle, or glides on swiveled roller bearing casters. Overall height, handle down, 13¼". Diameter of lamp, 10⅞". Bulb, 100 W or 250 W. Finish, red enamel and cadmium plate. Ask your supply house to show you this floodlite.

R. E. DIETZ COMPANY
NEW YORK
Pioneer Makers of Vehicle Lamps;
Founded 1840

Transportation Executive Available (Adv.)

GENERAL Fleet Manager seeks executive position with fleet operator in bus or taxicab business. . . . Have managed taxicab fleet for the past twelve years. . . . Can furnish excellent references. . . . Location immaterial. . . . Available on short notice. . . . Address B. E. R., c/o Editor, FLEET OWNER, 90 West St., New York, N. Y.

•

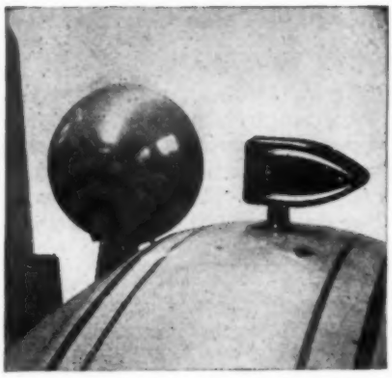
Bridgeport Thermostat Appoints Golob

APPOINTMENT is announced, of J. E. Golob, well known to car manufacturers, as sales engineer for Bridgeport Thermostat Company, Bridgeport, Conn. . . . He will make his headquarters in Detroit, Mich.

•

Salesmen Wanted (Adv.)

WANTED: Salesmen, in all sections of the United States, to sell power-operated elevating tail-gate for all types of truck bodies. . . . Attractive proposition to the right men. . . . This is an item in which there is no competition. . . . Men desired who have a good following among fleet operators. . . . Address Lang Industries, Inc., 90 West Street, New York, N. Y.



Back view, front signal lamp, informing cars alongside of a contemplated turn

TURN SIGNALS

SIMPLE IN OPERATION . . . .
EASY TO INSTALL . . . . . .
NO MAINTENANCE PROBLEMS

Watch for this trademark

TURN SIGNAL
CORPORATION
400 E. Rittenhouse Street
(Germantown) Philadelphia, Pa.

Plymouth Offers High-Wheel Model

PLYMOUTH now offers a line of its 1937 models, specially designed for smoother travel over deep-rutted roads in rural sections. . . . Twenty-inch metal disc wheels provide a road clearance of 9-⅞ inches, which is 1½ inches greater than standard design. A special gear-ratio of 4.3 to 1 is provided. . . . This equipment is available in all passenger-car body styles except the 7-passenger sedan.

•

Continental Profits in Second Quarter

CONTINENTAL Motors Corporation showed a net profit of $71,031.22 for its second quarter of the fiscal year ended April 30th, after depreciation, taxes and miscellaneous deductions, but before Federal income tax, according to W. R. Angell, president. . . . During the six-month period, an increase in sales of 46 per cent, over the same period of a year ago, was noted.

•

White Joins Clydesdale Truck Company

AMOS F. WHITE has recently resigned from the Kelly-Springfield Tire Company, to become vice-president of Clydesdale Motor Truck Company, Diesel-powered truck manufacturers of Clyde, Ohio, according to a recent announcement.

•

High-Grade Fleet Executive Available (Adv.)

I WANT the toughest job in fleet operation that is open today. My first choice is an unorganized fleet which needs standardization and the establishment of economic methods of operation. I have a background of over 20 years experience in just this sort of work, and gained most of this experience on the West Coast. For an interview, address Box 834, Old Greenwich, Conn.

"Geneva Truck Sales" Formed

AN agency for Autocar trucks, Geneva Truck Sales, Inc., has recently been formed, located at 120 Seymour St., Geneva, N. Y., serving the Counties of Wayne, Seneca, Ontario, Yates, Steuben, Cayuga, Schuyler and Chemung in New York State. . . . The activities of the new corporation will include all branches of truck repair and maintenance work, as well as a heavy-duty towing service within the territory mentioned. . . . Body work and painting will also be featured. . . . Fleet service, especially, is being solicited.

•

Traffic Manager Available (Adv.)

GENERAL Traffic Manager seeks position with large industrial firm operating their own fleet of trucks. . . . Have twenty years background in industrial traffic management, including wholesale truck transportation, local distribution, warehousing and truck costs. . . . Also wide experience in railroad transportation from industrial standpoint. . . . At present employed but desire to change; location immaterial. Available on short notice. . . . Address S. R. R., c/o Editor, FLEET OWNER, 90 West St., New York, N. Y.

•

THE Plus Zone Range of this Lincoln Fleet Shop Welder gives you a finer heat for the light jobs . . . a faster, more intense heat for the heavy jobs . . . in fact *any* heat you need for *any* job. All welding is *easier, quicker* and *stronger*. Every day you can save 50% to 100% on jobs like these:

Weld cracked steel wheels.
Weld snapped bumpers and supports.
Weld split rear axle housings.
Weld cracked cylinder heads and blocks.
Build chassis framework.
Build thin-gauge bodywork.
Weld broken transmission cases.
Repair broken seat legs.
Reinforce broken front axles.
Weld cracked brake shoes.
Weld broken levers, pedals, etc.
Repair frames and supports.
Repair radiator shells.

You can pay for this powerful motor-generator type arc welder out of a few months' savings . . . *ASK FOR PROOF!*

Salient Facts
RANGE . . 45 to 200 Amperes with reserve overload capacity.
SIZE . . . . Only 2 feet sq.
WEIGHT . Only 437 lbs.
AND THE PRICE IS SURPRISINGLY LOW
LINCOLN WELDER

THE LINCOLN ELECTRIC COMPANY
Largest Manufacturers of Arc Welding Equipment in the World

THE LINCOLN ELECTRIC COMPANY
Dept. WW-405, Cleveland, Ohio

Send a free copy of Bul. 314 describing the New Lincoln 150-Amp. Welder to —

Name _____ Position _____
Company _____
Address _____
City _____ State _____

CUT OIL COSTS
Save Engine Wear

Equip With Depth Type

MICHIANA DUO-FLO OIL FILTERS

●

Thousands of actual service records have established the unusual efficiency and ease of servicing the depth type Michiana Duo-Flo Filter.

In the sealed cartridge is the same "two-filters-in-one" as in the Duo-Flo element for H-W Filters. Greater filtering capacity and more thorough filtering, increase mileage before replacement,—cut oil costs and engine maintenance.

So Easy to Renew

As the illustration shows —replacement is quickly and easily made anywhere—and your filter is as good as new. The Duo-Flo principle has been recognized by experienced automotive engineers, engine builders and operators as the greatest advance in the design of practical oil filters.

Let us explain why Duo-Flo means savings to you—or write for Bulletin 337-F.

MICHIANA PRODUCTS CORP.
MICHIGAN CITY
INDIANA

Duo-Flo filtering is explained in Bulletin 337-F. Copy free on request.

Beats Safety Record—Loses Contest!

(*Continued from page* 26)

other's nerves.

"We also provide homes for drivers and we feel that this contributes greatly to the success of our safety program. The homes are close to the garage and we can supervise the drivers better. These things benefit the men as well as they do us and the men realize it. Hence their loyality."

●

Give Your Generators a Break

(*Continued from page* 46)

ally draw about six amperes. The heater takes 2.75 amperes. If we use a spotlight, it costs us 6.6 amperes, etc."

A table which tells the normal current draw of a large number of accessories used on a modern vehicle, accompanies this article. The figures given in it are somewhat typical of the amount of current used by electrical devices of this kind. With different makes, they may vary, of course.

"The moral of the story, of course, is to keep the battery in good condition and to have the generator checked from time to time so that it is giving maximum and efficient service.

"Modern air-cooled, heavy-duty over-size generators and storage batteries are rugged instruments. They are capable of taking care of the needs of the average vehicle when given normal care and attention. During the hot summer weather have the battery checked every week. During the winter, every three weeks or, if you operate more than the normal mileage, at more frequent intervals than those specified. The generator should be checked over after every 7,500 to 10,000 miles of service," Mr. Stambaugh concluded.

●

Some Interesting Data on Spark Plugs

THE first practical automobiles built some 40 years ago, did not use spark plugs, because there was no such thing as a spark plug then. Instead, there was a contrivance known as a "hot tube".

This statement was made recently by Sumner S. Howard, service engineer of the AC Spark Plug division of General Motors, in a talk on the influence of early day motorists on the present day automobiles.

The pioneer motorist would apply a blow torch to the "hot tube", Howard declared. In performing this operation he usually found it necessary to remove the front seat in order to gain access to the engine as the early cars boasted no hoods. If he succeeded in heating it to just the right temperature, the engine would start. If the tube became overheated, a backfire would result, often with dangerous consequences to the man at the crank. The early day motorist found one of his greatest handicaps in this "hot tube", and when it looked as though that hardy band of pioneer motorists was about to become extinct from backfire and bandages, the fiendish "hot tube" was discarded in favor of the "make and break" system.

This system was composed of a special sort of "plug" with the side electrode moving and contacting a stationary electrode in a manner similar to creating a spark by holding the loose ends of two wires, one in each hand, and constantly hitting the wires together.

After the "make and break" system, along came spark plugs.

"The first spark plugs were nothing to write home about", Howard said. "They were like politicians, promising much but delivering little. They were bought by the peck and thrown out by the bushel. The motorist who found as many as four to the peck that actually worked sometimes, was likely to win the reliability tour. If you installed in your modern high compression car of today a set of yesterday's spark plugs, you'd be lucky if they stood up for a single mile.

"However, in the intervening years of automotive progress, spark plugs, like other component parts of the automobile, have been constantly developed and improved so that they are today dependable, trouble-free and long-lived. And they will continue to function efficiently, requiring only that the firing points be adjusted each time that the spark plugs are cleaned, which should be twice yearly."

●

Trucking Firm Awards Four Safe Drivers

FOUR drivers employed by the Worcester Truck Company, Inc. of Worcester, Mass., have been rewarded for their accident-free driving records during the past year by the American Policyholders' Insurance Company, which, in cooperation with its policyholders, is promoting highway accident-prevention among employee drivers.

Two-year seals have been awarded to Thomas McGreevy and Thomas G. Whitney, and one-year award-of-merit cards to Roy MacPherson and Chauncey Dixon.

●

Offers Free "Digest" of I.C.C. Regulations

A DIGEST of the new Interstate Commerce Commission Safety Regulations, governing qualifications of employees and operation and equipment of trucks and buses, has been prepared in simplified form for free distribution by the Engineering Division of the Maryland Casualty Company, Baltimore, Md.

The new regulations, set up under the Motor Carrier Act of 1935, are to become effective July 1, 1937.

The Maryland Casualty booklet, designed particularly for reading by drivers of trucks and buses, explains in simple language all the important points of the new safety regulations, and is illustrated where necessary to make the subject clear. The condensation was done with the cooperation of the Section of Safety, Bureau of Motor Carriers, of the Interstate Commerce Commission.

In announcing the publication of the booklet, Holger Jensen, Manager of The Maryland's Engineering Division, said:

"While our booklet was prepared primarily for the instruction of drivers employed by fleet operators insuring with the Maryland Casualty Company, we will be glad to send copies to operators of motor carrier fleets, as well as to individual drivers of trucks and buses. The new rules embody certain basic principles of safe driving which, if followed, will help every driver avoid accidents."

For free copies, write to the Editor of this publication, stating how many you can use. We'll be glad to see that they are forwarded to you promptly, without cost or obligation.

THE CP FENDER IRON

CP Fender Iron ironing out damaged fender. Entire job completed without using hand tools (except roughing hammer).

- THE ONLY SUCCESSFUL FINISHING TOOL
- SMOOTHS OUT DENTS, WRINKLES AND ROUGH SPOTS
- IRONS METAL—DOES NOT STRETCH IT
- DOES A FASTER, BETTER JOB
- REDUCES COSTS 50%
- EASY TO OPERATE
- GUARANTEED BY WORLD'S LARGEST MANUFACTURER OF PNEUMATIC TOOLS

Write for illustrated 8-page folder No. 1913 and name of nearest distributor.

CHICAGO PNEUMATIC TOOL CO.

6 East 44th St. NEW YORK, N. Y.

Do This Job Quickly

. . . and NOT SO OFTEN

with Sterling Silver-Sheathed

● You won't have to replace spark plug wires often if you put in Sterling Silver-Sheathed Ignition Cable —and the handy Ignition Service Kit enables a man to do a factory-like job in no time at all. Silver-Sheathed is built to stand up in the toughest truck service. The Silver-Sheath (U. S. Pat. No. 1,987,508) is highly resistant to hot oil, grease, moisture and corona. In addition it is protected by a special heat-proof, flame-resistant lacquer. The cable delivers a full, hot spark to the plugs over many more miles and saves money on gas. Your jobber will give you full information.

. . . AND WHILE YOU'RE TALKING TO HIM

Ask him about Sterling-Nokrode Battery Cable with the patented terminal that absolutely *will not corrode*. Gets maximum power out of your battery. And when you do the job with Nokrode, it stays done!

STERLING CABLE CORPORATION • PORT HURON, MICHIGAN
A Division of Electric Auto-Lite Company

Sterling
"AN AUTO-LITE PRODUCT"
AUTOMOTIVE WIRES AND CABLES
U.S. PAT. 1,987,508

Transportation Is Largest User of Nickel

THE following summary of last year's developments affecting nickel is based on field investigations made by The International Nickel Company of Canada, Limited, and its subsidiaries.

Transportation retained its position during 1936 as the dominant field of nickel consumption. Reflecting the general increase in industrial activity, the several branches of transportation showed marked interest in new equipment.

Total automotive production in Canada and the United States for the first nine months of 1936 was 3,462,034 units, as compared with 3,012,628 units in 1935, an increase of approximately 13 per cent. Production increased in Great Britain and Germany also and was slightly off in France. At the same time consumption of nickel per automotive unit more than held its own.

Because American production, which is the outstanding factor in the automotive field, is geared to the schedule of a new model each year, there is a constant pressure for new materials, designs and features. Nickel-bearing alloys, irons and steels are being introduced as materials for automotive parts not previously containing nickel; in addition, there is a definite trend towards increasing the thickness of the nickel plating which is the basis for the chromium finish used for trim and hardware.

In the United Kingdom the strength-to-weight ratio is of primary importance in automotive design for two reasons, both of which stimulate a more general use of nickel. The continuing tendency to develop more powerful engines without raising gasoline consumption excessively has led to increasing demands on individual components, and the nickel steels are favored as the best materials available for providing high strength in light sections. At the same time the restrictions which have been placed on the loading per axle of commercial vehicles emphasize the need for reducing deadweight to the minimum. Nickel steels and nickel aluminum alloys are therefore being employed to save weight without sacrifice in the factor of safety.

The builders of French trucks and other commercial vehicles are even larger users of nickel steels for all such stressed parts as gears, crankshafts, etc. In France the average poundage of nickel per passenger car is higher than that obtaining in cars of American manufacture.

Development of the passenger car trailer into a volume industry is opening a new field for consumption of nickel alloys. Monel and stainless steel are coming into general use for galley sinks and wash basins, and a lightweight stainless steel trailer built on the principle of the streamlined Zephyr trains has been placed on the market.

A new section of the transportation field has been opened up by the growing use of trackless electric trolley buses in London and other British cities as well as in the United States. Nickel steels form such parts as the side members of the frames, front axles, rear axle casings, axle shafts, worm shafts and brake rods. In addition nickel and nickel compounds are the essential constituents of the alkaline storage batteries with which many of these buses are equipped for manoeuvering at terminals and for lighting and actual operation when the overhead supply of current is interrupted.

Another manufacturer of popular low-priced cars has recently been added to the list of those using nickel alloy steel for rear drive pinions. Other manufacturers are increasing the use of nickel steels for differential

gears, pinions, transmissions and exhaust valve heads.

Austenitic valve heads containing from 8 to 14 per cent of nickel are rapidly becoming standard in passenger cars.

The presence of overdrive units was a development in many of the new American models exhibited in November. These units are made almost entirely of nickel molybdenum steels.

Though the use of alloy cast irons is a recent development, today there is hardly an automotive engine casting which is not alloyed and nearly all contain nickel. This applies to Diesels as well as to the other types of passenger car, truck and tractor engines.

The American industry has increased its acceptance of nickel cast iron camshafts and Diesel engine crankshafts, so that a larger proportion of the manufacturers are using them than ever before. Cylinder heads, pistons and brake drums continue to adhere strictly to alloyed cast iron specifications.

A substantial tonnage of thermostatic alloys containing nickel is now used by the automobile industry. Thermostats control water temperature, carburetor air temperature, automatic chokes, hot water heaters, oil temperature, and even shock absorbers. Some cars carry as many as eight individual thermostats.

Low expansion nickel-silicon-aluminum alloys, particularly when electrolytically treated for corrosion resistance, are being widely used for pistons in the modern high speed car. They are responsible, in part, for the long life and low oil consumption now being realized, it is claimed.

Cylinder liners alloyed with nickel and chromium or nickel and molybdenum are in regular production for use in heavy duty trucks and buses. Records of 200,000 miles of service before reconditioning is necessary have been established as compared with 75,000 miles for the unalloyed type previously used.

In Germany the designers of automotive engines using light, quick running oils for fuel have adopted nickel alloy cast iron for cylinder blocks and heads in order to effect important weight reduction in relation to power.

The dies used by important American manufacturers for forming one-piece solid steel body tops are made of a nickel-chromium alloy cast iron with alloy steel inserts.

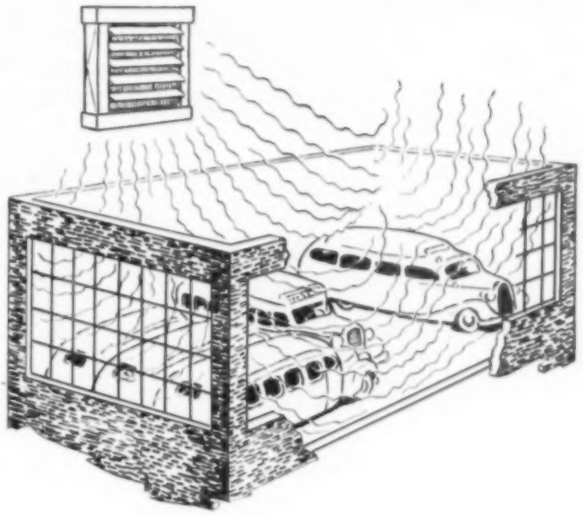
A new type of taxicab featuring the "sunshine" top has a gear ratchet plate of heavy gauge monel as an essential part of the mechanism for opening the top. Monel was chosen because of its strength, resistance to deformation, rustlessness and ease of fabrication.

In the field of heavy duty automotive equipment streamlined buses of stainless steel have been placed in service across the Syrian Desert, and corrugated stainless steel has been used for insulated bodies for a fleet of trucks delivering products to the chain stores of a large American bakery.

The new copper-nickel steels are helping truck manufacturers to meet the demand for tank trucks, vans and other delivery equipment capable of efficient, low cost operation. These intermediate steels are being used to manufacture trucks and trailers where reduction in weight without sacrifice of strength and wearing qualities is important.

A new model of heavy duty electric fork truck has been placed on the American market. It develops a lifting torque of 600,000 inch-pounds and will raise a load of 16,000 pounds to a height of 86 inches on the forks. More than 67 pounds of nickel are present in the alloy steels which form the main structure of each truck.

A "ROOMFUL" OF HEAT



If you act now, you can be sure every room in your shop will be a "roomful" of heat next winter! Heat in corners, under cars, right down to the floor.

That's Grinnell Thermolier heat! Owners report big savings over other systems because Thermolier gets all of the heat out of the steam and directs it where it's wanted!

Now is the time to investigate this better method of heating, with next winter's needs in mind. You'll be interested in Thermolier's 14 points of superiority — every one of them representing a dollars-and-cents saving! Write to Grinnell to-day for a copy of the Thermolier Data Book. Grinnell Company, Inc., Executive Offices, Providence, R. I. Branch offices in principal cities.

ABOVE the "LAZY WATER" LINE

It's the line that marks the top of "lazy water" — collected condensation—in a unit heater. Thermolier's Internal Cooling Leg keeps "lazy water" draining continuously—keeps ALL of the heater working, ALL of the time!

GRINNELL THERMOLIER

THE UNIT HEATER WITH 14 POINTS OF SUPERIORITY

Larcoloid!

The PERFECT
1-HOUR
DRY
ENAMEL

Out of tack in 15 - Minutes on the road in 1 - Hour

Service and Beauty go Hand in Hand With Larcoloid

Yes Sir! Mr. Fleet, Bus or Truck Owner, if you want a first class, good looking, finish job — if you want a durable job — if you want your equipment out of the shop in the shortest time possible, that's just what LARCOLOID will give you.

And what's more, LARCOLOID will give you a beautiful, lustrous, baked-on-enamel-like finish with adhesion, flexibility and durability second to none.

Expensive equipment is unnecessary for the application of LARCOLOID. It can be either sprayed or brushed on. When applied with a brush, it flows out smoothly and the brush marks disappear as you watch it flow from the brush.

Let Larcoloid put more dollars in your cash drawer

Larkin Co Inc. Paint Division, Buffalo, N.Y.

Tire Chief Cites Lower Cost, Better Mileage

THE average American truck or bus operator will spend approximately $65 for tires for each truck or bus he owns during 1937 as compared with more than $600 a truck or bus in 1920, according to W. C. Bray, B. F. Goodrich Company manager of truck and bus tire sales.

"In 1930 it required at least six new tires annually to keep the average truck or bus running and a truck or bus tire then cost approximately $108 and usually gave only about 5,000 miles of service," Bray said.

"Due to consistent improvements in tire quality resulting from research and development, tire mileage has increased many times in the past 15 years.

"However, it is interesting to note that the average tire consumption per truck or bus has remained fairly constant in spite of greater mileage; this is in part due to the use of trailers and the increase of tires from four to six, and even eight, per truck or bus as roads improved and loads increased."

●

Baking Company Drivers Rewarded for Safety

THREE employees of the Greenfield Baking Co. of Greenfield, Mass., were rewarded for their records of safe driving of company trucks without a reportable accident for periods of from one to six years, at a recent meeting of the company's drivers.

L. A. Phelps, treasurer of the Greenfield company, was in charge of the meeting at which Frederick J. Ranlett, Jr., safety engineer, presented certificates or seals on behalf of the American Policyholders' Insurance Company to the three men.

Arthur R. Tyler received a seal designating he had operated his vehicle for six years without an accident; Raymond H. Prest, a seal for four years; and Armand J. Thouin, a certificate of merit for one year.

State Police Officer Albert T. Hayes of the Northampton State Police Barracks spoke on "Highway Safety".

●

Diamond-T Offers New 1 to 1½-Tonner

(*Continued from page* 55)

which case rear drums are 15¼" x 2¼". Brakes require no lubrication. Braking pressure is automatically equalized on all four wheels and take-up for lining wear is accomplished by simple cam adjustment. The hand brake is in a contracting band mounted at the rear of the transmission.

In common with Diamond T practise, Model 301 is available with both standard and deluxe equipment. The deluxe truck carries a considerable amount of additional decorative equipment, including chrome-plated giant hub-caps, deluxe instrument panel with electrically-operated clock and cigar-lighter and white sidewall tires with chrome plated locking rings. In addition, the Diamond T Super-Service engine, which is optional on the standard model, is furnished as standard equipment on the deluxe truck. It features counterbalanced crankshaft, oil-bath air cleaner and Duo-Flo oil filter.

Two types of cabs are available; one the standard model and the other the deluxe. For further details address Diamond-T Motor Car Company, Chicago, Ill. . . . Mention of FLEET OWNER is always appreciated.

Modern trucks demand Diesel power and . . . the Cummins *Dependable* Diesel dominates the field because it will give twice the miles for half the cost . . . repeat orders are telling the story. Cummins Engine Company, 2020 Wilson St., Columbus, Indiana.

No Diesel can be any better than its FUEL SYSTEM
Read the record

CUMMINS *Dependable* DIESEL

PIONEER IN MODERN DIESEL DEVELOPMENT

6¢ WORTH OF *Sani-Flush* WOULD MAKE IT SO MUCH COOLER!

Beware of the clogged radiator that overheats motors. Costly repairs, delayed schedules, or wasted power may result. Sani-Flush will clean passenger car radiators for 6c (15c for largest trucks, buses and tractors).

Investigate Sani-Flush. Sold in economical 25-lb. pails by grocery, drug and hardware stores or jobbers. It is not caustic. Cannot injure the motor or fittings. The Hygienic Products Co., 218 Seventh St., Canton, Ohio.

FREE—WRITE ON YOUR FIRM'S STATIONERY FOR A GENEROUS SAMPLE OF SANI-FLUSH. TRY IT. NO OBLIGATION.

Veeder-Root HUBODOMETERS *point out chances to* CUT COSTS

The soundest basis of savings in oil, gas, tires and repairs is a true record of actual mileage. Given this, you can usually see chances to cut your costs.

Veeder-Root Hubodometers will give you the true story on your fleet's mileage. They clock up every mile a truck goes, backward and forward. Permanent accuracy is assured because these instruments can be adjusted to agree with all changes in wheel and tire dimensions —to 1/10".

And Veeder-Root Hubodometers are built to last as long as the trucks they're used on . . . . built dust-tight, and in such a way that tampering is easily detected. Write for proof of how they have helped other fleet owners to important savings.

VEEDER-ROOT Inc.

Hartford, Connecticut, U. S. A.

Use AMERICAN DECAL TRANSFERS FOR LETTERING AND ILLUSTRATIONS

SAVES YOU MONEY IF OPERATING TEN OR MORE TRUCKS

Replace costly, time taking hand lettering and illustrations on trucks with this modern method that assures uniformity and faithful reproduction. Decal transfers can be applied to a truck in less than an hour by any unskilled person. Follow the lead of other fleet owners and use American decal transfers. Write for samples and complete information.

Our art department will gladly prepare ideas and designs for your individual requirements. Consult us without obligation.

AMERICAN DECALCOMANIA CO.

4326 FIFTH AVE. CHICAGO

Quickly Removes Traffic Film!

Fleet owners everywhere quickly appreciate the fast and easy way MAGNUS No. 55-P removes grease and traffic film from truck and bus bodies. MAGNUS No. 55P contains no alkali, acid or abrasives—surfaces cleaned with it appear polished.

Experienced buyers like the economy of cleaning with MAGNUS No. 55-P, due to the speed with which it works. Write today for your copy of our "AUTOMOTIVE CLEANING HANDBOOK." It tells the whole truck and bus washing story.

MAGNUS CHEMICAL COMPANY
36 South Avenue Garwood, New Jersey

MAGNUS CLEANERS

AMERICAS VAN BODY BUILDERS

GERTENSLAGER BUILT BODIES

offer you superior construction, modern design, better appearance, more strength with less weight, and longer life—yet their cost is low. 77 years of building just good bodies—nothing else! Let us quote you. Address 102-150 E. Bowman St.

THE GERSTENSLAGER CO.
ESTAB. 1860. WOOSTER, OHIO

New Motion Picture on Hard-Facing

A NEW motion picture on hard-facing which shows, in detail, the process of adding wear-resisting surfaces to steel parts, is now available for showing to interested organizations or groups. This highly instructive motion picture has been produced by Haynes Stellite Company, a unit of Union Carbide and Carbon Corporation and can be obtained for showings through representatives of either Haynes Stellite Company or The Linde Air Products Company, 30 East 42nd Street, New York, N. Y.

The film begins with a brief description of what hard-facing is and how it is done. The scene then shifts to a series of unique views of the application of Haynes Stellite with the oxy-acetylene flame. The correct manner of applying this cobalt-chromium-tungsten alloy is effectively shown. Following this are views of various industrial applications of hard-facing, such as its use on steam valves for high-temperature, high-pressure service; automotive valve-seat inserts; cement-grinder rings; and dipper-bucket teeth. Throughout the film, emphasis is placed on effective methods of application and the economies resulting from the use of hard-facing.

BLACK GOLD *Specify*

MILEY BRAKE LINING

Nine types that not only assure the correct friction but the correct structure and the *best* braking material for each brake.

MILEY BLACK GOLD is the only metal base lining. Dense as cast iron, it is the best for Bendix, Lockheed, Steeldraulic, and Huck brakes—for all "depression year" mechanisms and others that compensate for lack of drum area with extreme operating pressure.

MILEY EBONITE Heavy Duty, a new zinc wire, synthetic resin, semi-molded, that comes in rolls. Sets, and on Miley Ready Lined Brake Shoes. Strictly heavy duty lining—that gives 2 wheel brakes 4 wheel power, and steps up 4 wheel brakes to power-brake performance. The best lining for Fords, Heavy Trucks, and External Brakes.

Write for Samples and Data Book

L. J. MILEY CO., Inc.
1466 S. MICHIGAN AVE
CHICAGO, ILLINOIS

SPONGEX Cushions are built *up* So they *won't pack down.*

Layer upon layer of Soft SPONGEX (**live** Sponge Rubber) are securely built **up** and **cemented** together, so that they keep their shape indefinitely. You may—in time— wear the cover off, but you can't wear them out during the ordinary life of the truck or bus.

Nothing to break—no hazard. Just **comfort — durability** — and **economy.** Equip your trucks and buses with SPONGEX Cushions **once** and eliminate your replacement problems.

THE SPONGE RUBBER PRODUCTS CO.
Derby, Conn. Dept. F.

LATHAN

LATHAN Power Brake
PACKAGE OUTFITS SAVE YOU MONEY
Write for Prices, Etc.

POWER BRAKE

SIMPLE and effective as railroad brakes. Quickly and easily installed. No oiling, no greasing, no maintenance. Used for years by largest operators. Complete line. Low-priced Package Outfits. Nation-wide sales and service. Write for FREE Catalog.

Lathan Co., Inc. SOUTH SAN FRANCISCO—Calif DETROIT—477 Selden Ave

SKF BALL BEARINGS

Eliminate the cost of taking bearings OUT by putting SKF Bearings IN.

MASTERCRAFT
TRUCK BODIES
1937 Retail Milk Delivery Body
One step entrance. Furnished for 112" and 120" 1½ ton, and 120" 1 ton Dodge chassis. Write us or contact your local Dodge Dealer for complete data.
LUCE MANUFACTURING CO. LANSING, MICHIGAN

Purchasing Practices Standardized

THE following are the principles and standards of purchasing practice as advocated by the National Association of Purchasing Agents. We are pleased to pass them on to fleet operators, for whatever they may be worth:

(1). To consider, first, the interests of his company in all transactions, and to carry out and believe in its established policies.

(2). To be receptive to competent counsel from his colleagues and to be guided by such counsel without impairing the dignity and responsibility of his office.

(3). To buy without prejudice, seeking to obtain the maximum ultimate value for each dollar of expenditure.

(4). To strive consistently for knowledge of the materials and processes of manufacture, and to establish practical methods for the conduct of his office.

(5). To subscribe to and work for honesty and truth in buying and selling, and to denounce all forms and manifestations of commercial bribery.

(6). To accord a prompt and courteous reception, so far as conditions will permit, to all who call on a legitimate business mission.

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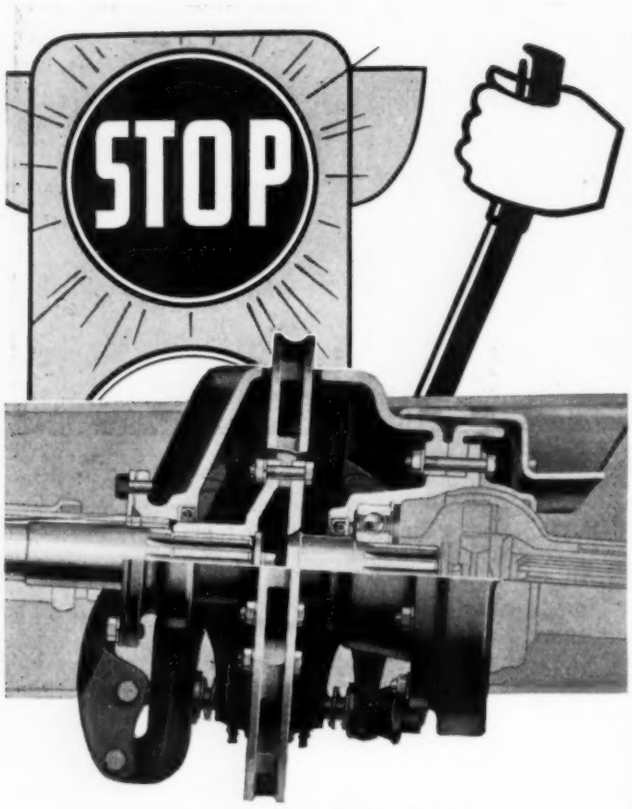

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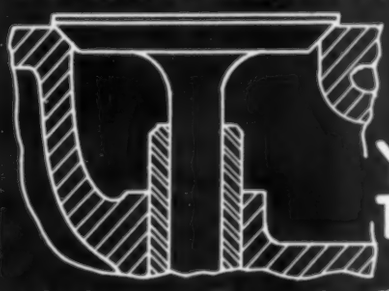

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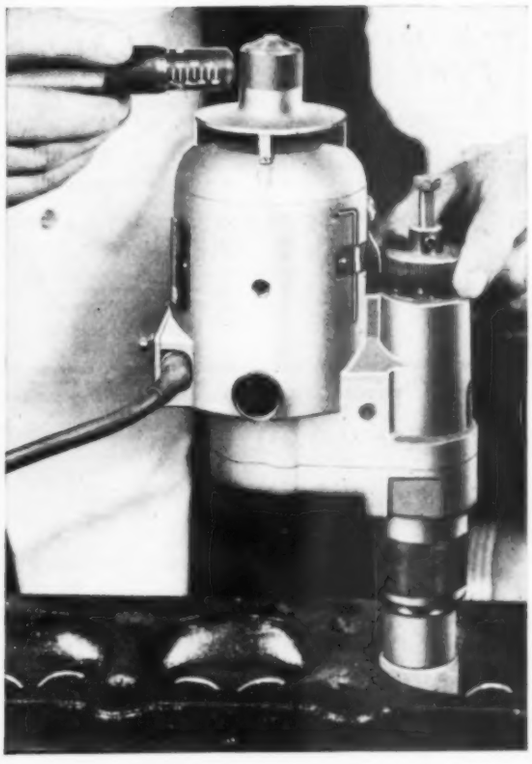

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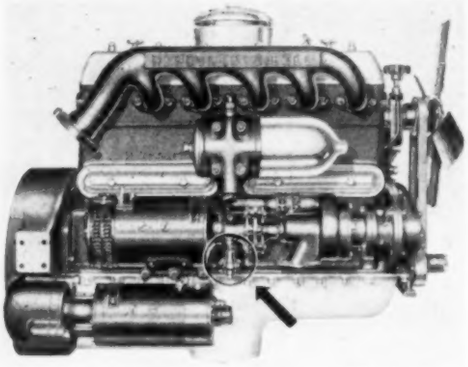

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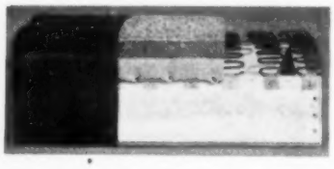

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